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CLAIMS

[Claim(s)]

[Claim 1] The interior is formed in the Maine case (1) where a fluid flows, said Maine case (1), and another object. The subcase by which it has been arranged in said Maine case (1) as the end side (114) touched the 1st wall surface (1d) of said Maine case (1) (11), Near said 1st wall surface (1d) by said 1st wall surface (1d), the revolving shaft (13) arranged at abbreviation parallel and said 1st wall surface (1d), and said subcase (11) The 1st fluid channel formed inside said subcase (11) (101), As opposed to said 1st fluid channel (101) to the shaft orientations of said revolving shaft (13) at juxtaposition And the 2nd fluid channel formed in the outside of said subcase (11) (102), With Itabe formed in said Maine case (1) and said subcase (11) as interrupted said 1st and 2nd fluid channel (101 102), respectively (111, 113, 1c) Free passage opening which is formed in said Itabe (111, 113, 1c), and constitutes said a part of 1st and 2nd fluid channel (101 102) (101a, 102a), While being fixed to said revolving shaft (13) and fixed to said revolving shaft (13) with the 1st door (30) of the tabular cantilever type which attaches and detaches said Itabe (111), and opens and closes free passage opening (101a) in said 1st fluid channel (101) To said 1st door (30), shift the location of the shaft orientations of a revolving shaft (13), and the rotation direction of said revolving shaft (13), and it is arranged. And it is a path switchgear equipped with the 2nd door (20) of the tabular cantilever type which attaches and detaches said Itabe (113 1c), and opens and closes free passage opening (102a) in said 2nd fluid channel (102). The field of the side which touches said Itabe (111) in said 1st door (30) is equipped with packing (302) for seals. So that the edge by the side of said 1st wall surface (1d) in said packing (302) may touch said 1st wall surface (1d), when said packing (302) touches said Itabe (111) The path switchgear characterized by extending said packing (302) from said revolving shaft (13) at said 1st wall surface (1d) side.

[Claim 2] Said 1st door (30) is a path switchgear according to claim 1 characterized by having the substrate section (301) connected with said revolving shaft (13), extending said substrate section (301) from said revolving shaft (13) at said 1st wall surface (1d) side, and equipping said substrate section (301) with said packing (302).

[Claim 3] The interior is formed in the Maine case (1) where a fluid flows, said Maine case (1), and another object. The subcase by which it has been arranged in said Maine case (1) as the end side (114) touched the 1st wall surface (1d) of said Maine case (1) (11), Near said 1st wall surface (1d) by said 1st wall surface (1d), the revolving shaft (13) arranged at abbreviation parallel and said 1st wall surface (1d), and said subcase (11) The 1st fluid channel formed inside said subcase (11) (101), As opposed to said 1st fluid channel (101) to the shaft orientations of said revolving shaft (13) at juxtaposition And the 2nd fluid channel formed in the outside of said subcase (11) (102), With Itabe formed in said Maine case (1) and said subcase (11) as interrupted said 1st and 2nd fluid channel (101 102), respectively (111, 113, 1c) Free passage opening which is formed in said Itabe (111, 113, 1c), and constitutes said a part of 1st and 2nd fluid channel (101 102) (101a, 102a), While being fixed to said revolving shaft (13) and fixed to said revolving shaft (13) with the 1st door (30) of the tabular cantilever type which attaches and detaches said Itabe (111), and opens and closes free passage opening (101a) in said 1st fluid channel (101) To said 1st door (30), shift the location of the shaft orientations of a revolving shaft (13), and the

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rotation direction of said revolving shaft (13), and it is arranged. And it is a path switchgear equipped with the 2nd door (20) of the tabular cantilever type which attaches and detaches said Itabe (113 1c), and opens and closes free passage opening (102a) in said 2nd fluid channel (102). The path switchgear characterized by preparing the seal member (303) which carries out the seal of between said revolving shaft (13) and said 1st wall surface (1d) between said revolving shaft (13) and said 1st wall surface (1d).

[Claim 4] Said seal member (303) is a path switchgear according to claim 3 characterized by having covered the peripheral face of said revolving shaft (13).

[Claim 5] Said seal member (303) is a path switchgear according to claim 3 characterized by equipping said 1st wall surface (1d).

[Claim 6] Said subcase (11) is claim 1 which resin shaping is carried out and is characterized by performing mold omission at the time of molding toward the end side (114) of said subcase (11) thru/or the path switchgear of any one publication of five.

[Claim 7] Said Maine case (1) is claim 1 which resin shaping is carried out and is characterized by carrying out mold omission at the time of molding of said Maine case (1) to the shaft orientations of said revolving shaft (13) in the condition of having attached said revolving shaft (13) thru/or the path switchgear of any one publication of six.

[Claim 8] It is an air conditioner for cars using claim 1 thru/or the path switchgear of any one publication of seven. It has the heat exchanger for cooling (3) which cools air, and the heat exchanger for heating (4) which heats air in said Maine case (1). Said 1st and 2nd fluid channel (101 102) is an air conditioner for cars characterized by being the path to which the air conditioning wind cooled and heated by said both heat exchangers (3 4) is led.

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DETAILED DESCRIPTION

[Detailed Description of the Invention]

[0001]

[Field of the Invention] This invention applies [to the air conditioner for cars] about the path switchgear which opens and closes at least two fluid channels at an offset door and is effective.

[0002]

[Description of the Prior Art] In the path switchgear which opens and closes two fluid channels arranged at juxtaposition, the offset door which has two cantilever type doors which shifted the location of the shaft orientations of a revolving shaft and the rotation direction of a revolving shaft, and have been arranged may be used.

[0003]

[Problem(s) to be Solved by the Invention] However, in the path switchgear using an offset door, there is a problem that wind leakage arises from the clearance between the revolving shaft of an offset door and a case, like the after-mentioned as mentioned above.

[0004] The point which this wind leakage produces is explained based on drawing 1 -7. Drawing 1 -7 are the mimetic diagram of the air conditioner for cars containing the path switchgear which used the offset door, and they are a thing which this invention persons are developing. here -- drawing 1 and 2 -- the negotiation direction of air -- abbreviation -- the D-D sectional view of drawing 5 and drawing 7 of C view drawing and drawing 6 as which the parallel cross section (the A-A cross section and B-B cross section of drawing 3) is shown, the mimetic diagram and drawing 4 as which drawing 3 regarded the air conditioner from the outlet side of air looked at the perspective view of a subcase, and drawing 5 looked at near the subcase from [of drawing 1] C are E view drawings of drawing 5 .

[0005] In drawing 1 and drawing 2 , while 1 constitutes the air duct to which air circulates, it is the Maine case made of resin (polypropylene etc.) which contains the heat exchanger 3 for cooling and the device for air conditioning of the heat exchanger 4 grade for heating which are mentioned later, and the inside-and-outside mind switching unit (not shown) which can introduce selectively the air of the vehicle interior of a room and vehicle outdoor air is formed in the air flow upstream of this Maine case 1. In addition, as shown in drawing 3 , the Maine case 1 consists of right case 1a and left case 1b which were divided into the car longitudinal direction.

[0006] And the blower 2 of a centrifugal type is formed in the air flow downstream of an inside-and-outside mind switching unit, and the heat exchanger 3 for cooling which cools the air ventilated from the blower 2 is arranged in the air flow downstream of this blower 2. In addition, by carrying out heat exchange of the refrigerant and air which circulate through the inside of the heat exchanger 3 for cooling, and evaporating a refrigerant, the heat exchanger 3 for cooling is an evaporator which cools air, and is a heat exchanger of the low-tension side of a well-known steamy compression equation refrigerating cycle.

[0007] It is the heat exchanger for heating which heats the air which 4 made the heat source waste heat (cooling water) of the internal combustion engine for transit (engine), and passed the heat exchanger 3 for cooling, and 5 is a bypass path which the heat exchanger 4 for heating is bypassed [path] and

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circulates air. And an air-capacity rate with the warm air heated by passing the cold blast and the heat exchanger 4 for heating which circulate the bypass path 5 by the air mix door 6 is adjusted, and the temperature of the air which blows off to the vehicle interior of a room is adjusted.

[0008] In addition, cold blast and warm air circulate towards each opening mentioned later, after being mixed by the air mix chamber (air mixing plenum) 7 prepared in the air flow downstream of the bypass path 5.

[0009] 8 is defroster opening which supplies the air which blows off towards the windowpane (not shown) of the front face of a car, and this defroster opening 8 is opened and closed by differential-gear door 8a. Front seat face opening which supplies the air from which 9 blows off towards front seat crew's upper half of the body, and 10 are foot openings which supply the air which blows off towards crew's lower half of the body, and the front seat face opening 9 and the foot opening 10 are changed by the foot face door 20, and are opened and closed.

[0010] As shown in drawing 3, the subcase 11 made of resin (polypropylene etc.) which divides an air duct into two or more (3) is formed, and the 1st air duct 101 and the air duct of a call and the right-and-left both sides of the 1st air duct 101 are hereafter called the 2nd air duct 102 for the air duct of a space center section to the part which stands in a row more directly [the face opening 9 and the foot opening 10] among the air ducts of the air flow downstream than the air mix chamber 7.

[0011] As shown in drawing 2 and 3, the front seat face opening 9 is not formed in the 1st air duct 101, but the backseat face opening 12 which supplies the air which blows off to a way side car back seat at the assembly is formed in it, and this backseat face opening 12 is opened and closed by the backseat face door 30. On the other hand, the front seat face opening 9 is formed in an upper part side, and, as for the 2nd air duct 102, the foot opening 10 for car front seats is formed in the lower part side.

[0012] And as shown in drawing 5 - drawing 7, the foot face door 20 and the backseat face door 30 are the so-called offset doors, it is fixed to the common revolving shaft 13, and the location of the rotation direction of a revolving shaft 13 is shifted about 90 degrees by this example, and these doors 20 and 30 are arranged while shifting the location of the shaft orientations of a revolving shaft 13 and being arranged.

[0013] As the 2nd air duct 102 is interrupted in the interior of the Maine case 1, 2nd Itabe 1c is formed in it, and 2nd free passage opening 102a which makes a part of 2nd air duct 102 is formed in 2nd Itabe 1c. And the foot face door 20 attaches and detaches 2nd Itabe 1c, and opens and closes 2nd free passage opening 102a.

[0014] The gross shape of a subcase 11 is as being shown in drawing 4, as the 1st air duct 101 is interrupted in the interior of a subcase 11, 1st Itabe 111 is formed in it, and 1st free passage opening 101a which makes a part of 1st air duct 101 is formed in 1st Itabe 111. And the backseat face door 30 attaches and detaches 1st Itabe 111, and opens and closes 1st free passage opening 101a. In addition, 112 is a bearing slot where a revolving shaft 13 is inserted. Moreover, 113 is Itabe formed as interrupted the 2nd air duct 102, and encloses 2nd free passage opening 102a with 2nd Itabe 1c of the Maine case 1.

[0015] Although a subcase 11 has the shape of a cube type in which the end face 114 of the side which touches 1d of wall surfaces of the Maine case 1 carried out opening and mold omission is performed toward the opening end-face 114 side of a subcase 11 in this case like the arrow head F of drawing 4 at the time of molding of a subcase 11 If it is going to extract a mold like a party in the direction of F after forming 1st free passage opening 101a, at least part I shown in the end side of 1st free passage opening 101a, i.e., drawing 4, and drawing 5 with a two-dot chain line cannot form 1st Itabe 111 in a.

[0016] Thus, when at least part I cannot form Itabe in a and the backseat face door 30 closes 1st free passage opening 101a in contact with 1st Itabe 111, wind leakage arises from 1d of wall surfaces of the Maine case 1 which forms the 1st air duct 101 with a subcase 11, and the clearance between revolving shafts 13 like an arrow head G (refer to drawing 7).

[0017] On the other hand, if at least part I tends to form Itabe of a in the Maine case 1, interference with the foot face door 20 will pose a problem as follows.

[0018] Namely, mold omission at the time of molding is carried out to the shaft orientations of the revolving shaft 13 in the condition that the right-and-left cases 1a and 1b which constitute the Maine

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case 1 attached the revolving shaft 13, and, as for right case 1a, mold omission is performed toward the direction of arrow-head H of drawing 5 among the right-and-left cases 1a and 1b. Therefore, if at least part I tends to fabricate Itabe of a like a party in the Maine case 1 in the case of this direction of mold omission, Itabe will be formed also in b at least for part II shown in drawing 6 and drawing 7 with a two-dot chain line.

[0019] And b has at least this part II in the actuation range of the foot face door 20 which is one door of an offset door, therefore if Itabe is formed also in b, it will interfere at least in part II with the foot face door 20, and the original function (closing motion function of a path) as a path switchgear is no longer obtained.

[0020] This invention was made in view of the above-mentioned point, and it aims at enabling prevention of the wind leakage from the part of the revolving shaft of an offset door, securing the closing motion function of a path in the path switchgear using an offset door.

[0021]

[Means for Solving the Problem] In order to attain the above-mentioned object, in invention according to claim 1 The Maine case (1) where a fluid flows the interior, and the subcase arranged in the Maine case (1) as it was formed in the Maine case (1) and another object and the end side (114) touched the 1st wall surface (1d) of the Maine case (1) (11), Near the 1st wall surface (1d) by the 1st wall surface (1d), the revolving shaft (13) arranged at abbreviation parallel and the 1st wall surface (1d), and the subcase (11) The 1st fluid channel formed inside the subcase (11) (101), As opposed to the 1st fluid channel (101) to the shaft orientations of a revolving shaft (13) at juxtaposition And the 2nd fluid channel formed in the outside of a subcase (11) (102), With Itabe formed in the Maine case (1) and the subcase (11) as interrupted the 1st and 2nd fluid channel (101 102), respectively (111, 113, 1c) Free passage opening which is formed in Itabe (111, 113, 1c), and constitutes a part of 1st and 2nd fluid channel (101 102) (101a, 102a), While being fixed to a revolving shaft (13) and fixed to a revolving shaft (13) with the 1st door (30) of the tabular cantilever type which attaches and detaches Itabe (111), and opens and closes free passage opening (101a) in the 1st fluid channel (101) To the 1st door (30), shift the location of the shaft orientations of a revolving shaft (13), and the rotation direction of a revolving shaft (13), and it is arranged. And it is a path switchgear equipped with the 2nd door (20) of the tabular cantilever type which attaches and detaches Itabe (113 1c), and opens and closes free passage opening (102a) in the 2nd fluid channel (102). The field of the side which touches Itabe (111) in the 1st door (30) is equipped with packing (302) for seals. When packing (302) touches Itabe (111), it is characterized by extending packing (302) from the revolving shaft (13) at the 1st wall surface (1d) side so that the edge by the side of the 1st wall surface (1d) in packing (302) may touch the 1st wall surface (1d).

[0022] According to this, in a path switchgear equipped with the 1st and 2nd door which shifted the location of the shaft orientations of a revolving shaft 13, and the rotation direction of a revolving shaft, and has been arranged, when the edge of packing 302 touches the 1d of the 1st wall surface of the Maine case 1 at the time of the clausilium of the 1st door 30, the wind leakage from the clearance between 1d of wall surfaces and a revolving shaft 13 can be prevented.

[0023] By the way, as mentioned above, when at least part I shown in drawing 4 and drawing 5 with a two-dot chain line tends to form Itabe in a and it is going to prevent the wind leakage from the clearance between 1d of wall surfaces, and a revolving shaft 13, Itabe will be formed in b at least for part II shown in drawing 6 and drawing 7 with a two-dot chain line due to the direction of mold omission of the Maine case 1. And Itabe of b interferes at least in part II with the 2nd door 20, and the original function (closing motion function of a path) as a path switchgear is no longer obtained.

[0024] On the other hand, in invention according to claim 1, since it is the configuration of extending packing 302 to 1d side of the 1st wall surface, and preventing wind leakage rather than a revolving shaft 13, it becomes unnecessary at least for part I to form Itabe in a, and since Itabe is no longer formed in b at least for part II in connection with it, the problem of interference with Itabe of b only of the 2nd door 20 and part II is lost.

[0025] Therefore, in the path switchgear using an offset door, the wind leakage from the part of the revolving shaft 13 of an offset door can be prevented, securing the closing motion function of a path.

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[0026] The Maine case where a fluid flows the interior in invention according to claim 3 (1), The subcase arranged in the Maine case (1) as it was formed in the Maine case (1) and another object and the end side (114) touched the 1st wall surface (1d) of the Maine case (1) (11), Near the 1st wall surface (1d) by the 1st wall surface (1d), the revolving shaft (13) arranged at abbreviation parallel and the 1st wall surface (1d), and the subcase (11) The 1st fluid channel formed inside the subcase (11) (101), As opposed to the 1st fluid channel (101) to the shaft orientations of a revolving shaft (13) at juxtaposition And the 2nd fluid channel formed in the outside of a subcase (11) (102), With Itabe formed in the Maine case (1) and the subcase (11) as interrupted the 1st and 2nd fluid channel (101 102), respectively (111, 113, 1c) Free passage opening which is formed in Itabe (111, 113, 1c), and constitutes a part of 1st and 2nd fluid channel (101 102) (101a, 102a), While being fixed to a revolving shaft (13) and fixed to a revolving shaft (13) with the 1st door (30) of the tabular cantilever type which attaches and detaches Itabe (111), and opens and closes free passage opening (101a) in the 1st fluid channel (101) To the 1st door (30), shift the location of the shaft orientations of a revolving shaft (13), and the rotation direction of a revolving shaft (13), and it is arranged. And it is a path switchgear equipped with the 2nd door (20) of the tabular cantilever type which attaches and detaches Itabe (113 1c), and opens and closes free passage opening (102a) in the 2nd fluid channel (102). It is characterized by preparing the seal member (303) which carries out the seal of between a revolving shaft (13) and the 1st wall surface (1d) between a revolving shaft (13) and the 1st wall surface (1d).

[0027] According to this, the wind leakage from the clearance between 1d of wall surfaces and a revolving shaft 13 can be prevented by the seal member 303 prepared between a revolving shaft 13 and the 1d of the 1st wall surface.

[0028] Moreover, since it is the configuration of preventing wind leakage by the above-mentioned seal member 303, Itabe of b only of part II which shows at least part I shown in drawing 4 and drawing 5 with a two-dot chain line to a and drawing 6, and drawing 7 with a two-dot chain line is lost, and the problem of the interference only to the 2nd door 20 and part II of an offset door with Itabe of b of it is lost.

[0029] Therefore, in the path switchgear using an offset door, the wind leakage from the part of the revolving shaft 13 of an offset door can be prevented, securing the closing motion function of a path.

[0030] In addition, the sign in the parenthesis of each above-mentioned means shows response relation with the concrete means of a publication to the operation gestalt mentioned later.

[0031]

[Embodiment of the Invention] (The 1st operation gestalt) Drawing 8 - drawing 11 show the 1st operation gestalt, and this operation gestalt applies the path switchgear concerning this invention to the air conditioner for cars. And since the whole air-conditioner configuration and actuation are the same as that of the air conditioner shown in drawing 1 - drawing 3, here explains them based on drawing about the part about a path switchgear. In addition, the I-I sectional view of drawing 9 and drawing 11 of C view drawing and drawing 10 as which drawing 8 looked at the perspective view of a subcase, and drawing 9 looked at near the subcase from [of drawing 1] C are J view drawings of drawing 9.

[0032] As shown in drawing 9 - drawing 11, near the 1d (the 1st wall surface) of the wall surfaces by the side of the car back in the Maine case 1 made of resin (polypropylene etc.), a revolving shaft 13 is arranged to 1d of wall surfaces, abbreviation parallel, and a horizontal direction, and this revolving shaft 13 is supported free [a revolution] in bearing (graphic display abbreviation) of the Maine case 1, or the bearing slot 112 of a subcase 11.

[0033] The backseat face door (the 1st door) 30 of a tabular cantilever type and the foot face door (the 2nd door) 20 of a tabular cantilever type are being fixed to the revolving shaft 13, the location of the rotation direction of a revolving shaft 13 is shifted about 90 degrees by this example, and these doors 20 and 30 are arranged while shifting the location of the shaft orientations of a revolving shaft 13 and being arranged.

[0034] The subcase 11 made of resin (polypropylene etc.) which divides this air duct into the air duct of the air flow downstream two or more (3) is arranged from the air mix chamber 7 within the Maine case 1.

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[0035] The opening end face 114 of this subcase 11 is in contact with 1d of wall surfaces, and the 1st air duct (the 1st fluid channel) 101 is formed inside the subcase 11 of a subcase 11 and 1d of wall surfaces. On the other hand, the 2nd air duct 102 (the 2nd fluid channel) is formed in juxtaposition to the 1st air duct (the 1st fluid channel) 101 on the outside (both sides of a subcase 11) of a subcase 11 at the shaft orientations of a revolving shaft 13.

[0036] As the 2nd air duct 102 is interrupted in the interior of the Maine case 1, 2nd Itabe 1c is formed in it, and 2nd free passage opening 102a which makes a part of 2nd air duct 102 is formed in 2nd Itabe 1c. And the foot face door 20 attaches and detaches 2nd Itabe 1c, and opens and closes 2nd free passage opening 102a.

[0037] As the 1st air duct 101 is interrupted in the interior of a subcase 11, 1st Itabe 111 is formed in it, and 1st free passage opening 101a which makes a part of 1st air duct 101 is formed in 1st Itabe 111. And the backseat face door 30 attaches and detaches 1st Itabe 111, and opens and closes 1st free passage opening 101a.

[0038] In addition, 112 is a bearing slot where a revolving shaft 13 is inserted. Moreover, 113 is Itabe formed as interrupted the 2nd air duct 102, and encloses 2nd free passage opening 102a with 2nd Itabe 1c of the Maine case 1. Moreover, height 1e which is prolonged in a revolving shaft 13 and parallel, and projects toward a revolving-shaft 13 side is formed in 1d of wall surfaces of the Maine case 1, and the notch 115 is formed in the opening end face 114 of a subcase 11 in order to avoid interference with height 1e.

[0039] Especially the backseat face door 30 consists of the substrate section 301 which consists of rigid high construction material (resin, such as polypropylene) comparatively, and packing 302 for seals which consists of porosity foam (for example, urethane foam) so that clearly from drawing 11 .

[0040] The substrate section 301 consists of main substrate section 301a to which the backseat face door 30 extends in 1d side of anti-wall surfaces rather than a revolving shaft 13 on the basis of the location (condition of drawing 11) which closed 1st free passage opening 101a, and extension 301b prolonged in 1d side of wall surfaces rather than a revolving shaft 13. Moreover, the substrate section 301 is offset from the axis of a revolving shaft 13, and is a revolving shaft 13 and really fabricated, and the whole surface of the side which touches Itabe 111 in the substrate section 301 is a flat surface.

[0041] And when it is equipped with packing 302 all over the side which touches Itabe 111 in the substrate section 301 (pasting) and the backseat face door 30 closes 1st free passage opening 101a, end-face 302a by the side of 1d of wall surfaces of packing 302 contacts height 1e.

[0042] According to this above-mentioned operation gestalt, by extending the packing 302 of the backseat face door 30 to 1d side of wall surfaces rather than a revolving shaft 13 When the packing 302 of the backseat face door 30 closes 1st free passage opening 101a in contact with Itabe 111 Since he is trying for end-face 302a by the side of 1d of wall surfaces of packing 302 to contact height 1e, the wind leakage from the clearance between 1d of wall surfaces of the Maine case 1 and a revolving shaft 13 can be prevented.

[0043] Moreover, since it is the configuration of extending packing 302 to 1d side of wall surfaces, and preventing wind leakage rather than a revolving shaft 13, it becomes unnecessary at least for part II which shows at least part I shown in drawing 4 and drawing 5 with a two-dot chain line to a and drawing 6 , and drawing 7 with a two-dot chain line to form Itabe in b, and the problem of the interference only to the foot face door 20 and part II with Itabe of b of it is lost.

[0044] In addition, although height 1e is formed to the installation range of the foot face door 20, since the packing 302 of the backseat face door 30 is extended to 1d side of wall surfaces rather than a revolving shaft 13 and the projection height of height 1e is made low, there is no interference with height 1e and the foot face door 20 on shaping of the Maine case 1.

[0045] Therefore, in the path switchgear using an offset door, the wind leakage from between 1d of wall surfaces of the Maine case 1 and the revolving shafts 13 of an offset door can be prevented, securing the closing motion function of a path.

[0046] (The 2nd operation gestalt) Although the wind leakage from the clearance between 1d of wall surfaces of the Maine case 1 and a revolving shaft 13 was prevented with the above-mentioned 1st

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operation gestalt by making end-face 302a by the side of 1d of wall surfaces of packing 302 contact height 1e Height 1e is abolished and you may make it make end-face 302a by the side of 1d of wall surfaces of packing 302 contact 1d of wall surfaces of the Maine case 1 directly like the 2nd operation gestalt shown in drawing 12 .

[0047] According to this operation gestalt, in the path switchgear using an offset door, the wind leakage from between 1d of wall surfaces of the Maine case 1 and the revolving shafts 13 of an offset door can be prevented like the 1st operation gestalt, securing the closing motion function of a path.

[0048] (The 3rd operation gestalt) Further, like the 3rd operation gestalt shown in drawing 13 , while abolishing height 1e When 1f of slanting sides is formed in 1d of wall surfaces of the Maine case 1 and the backseat face door 30 closes 1st free passage opening 101a, you may make it make the corner of end-face 302a by the side of 1d of wall surfaces of packing 302 contact 1f of slanting sides.

[0049] According to this operation gestalt, in the path switchgear using an offset door, the wind leakage from between 1d of wall surfaces of the Maine case 1 and the revolving shafts 13 of an offset door can be prevented like the 1st operation gestalt, securing the closing motion function of a path.

[0050] (The 4th operation gestalt) Drawing 14 shows the 4th operation gestalt, and by the seal member 303 which extended the end of packing 302, the peripheral face of a revolving shaft 13 is located in a bonnet, and it is locating the seal member 303 between a revolving shaft 13 and 1d of wall surfaces of the Maine case 1. Thereby, the peripheral face of the seal member 303 contacts 1d of wall surfaces of the Maine case 1, and carries out the seal of between a revolving shaft 13 and 1d of wall surfaces.

[0051] According to this operation gestalt, in the path switchgear using an offset door, the wind leakage from between 1d of wall surfaces of the Maine case 1 and the revolving shafts 13 of an offset door can be prevented like the 1st operation gestalt, securing the closing motion function of a path.

[0052] (Other operation gestalten) With the above-mentioned 4th operation gestalt, although the revolving shaft 13 was equipped with the seal member 303, 1d of wall surfaces of the Maine case 1 may be equipped with a seal member. In this case, locate a seal member between a revolving shaft 13 and 1d of wall surfaces of the Maine case 1, a seal member is made to contact the peripheral face of a revolving shaft 13, and the seal of between a revolving shaft 13 and 1d of wall surfaces is carried out.

[0053] Moreover, with an above-mentioned operation gestalt, although the operation gestalt of this invention was explained to the example for the air conditioner for cars, this invention can apply other fluid channels also to the equipment which carries out change-over closing motion, without being limited to this.

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TECHNICAL FIELD

[Field of the Invention] This invention applies [to the air conditioner for cars] about the path switchgear which opens and closes at least two fluid channels at an offset door and is effective.

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PRIOR ART

[Description of the Prior Art] In the path switchgear which opens and closes two fluid channels arranged at juxtaposition, the offset door which has two cantilever type doors which shifted the location of the shaft orientations of a revolving shaft and the rotation direction of a revolving shaft, and have been arranged may be used.

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TECHNICAL PROBLEM

[Problem(s) to be Solved by the Invention] However, in the path switchgear using an offset door, there is a problem that wind leakage arises from the clearance between the revolving shaft of an offset door and a case, like the after-mentioned as mentioned above.

[0004] The point which this wind leakage produces is explained based on drawing 1 -7. Drawing 1 -7 are the mimetic diagram of the air conditioner for cars containing the path switchgear which used the offset door, and they are a thing which this invention persons are developing. here -- drawing 1 and 2 -- the negotiation direction of air -- abbreviation -- the D-D sectional view of drawing 5 and drawing 7 of C view drawing and drawing 6 as which the parallel cross section (the A-A cross section and B-B cross section of drawing 3) is shown, the mimetic diagram and drawing 4 as which drawing 3 regarded the air conditioner from the outlet side of air looked at the perspective view of a subcase, and drawing 5 looked at near the subcase from [of drawing 1] C are E view drawings of drawing 5 .

[0005] In drawing 1 and drawing 2 , while 1 constitutes the air duct to which air circulates, it is the Maine case made of resin (polypropylene etc.) which contains the heat exchanger 3 for cooling and the device for air conditioning of the heat exchanger 4 grade for heating which are mentioned later, and the inside-and-outside mind switching unit (not shown) which can introduce selectively the air of the vehicle interior of a room and vehicle outdoor air is formed in the air flow upstream of this Maine case 1. In addition, as shown in drawing 3 , the Maine case 1 consists of right case 1a and left case 1b which were divided into the car longitudinal direction.

[0006] And the blower 2 of a centrifugal type is formed in the air flow downstream of an inside-and-outside mind switching unit, and the heat exchanger 3 for cooling which cools the air ventilated from the blower 2 is arranged in the air flow downstream of this blower 2. In addition, by carrying out heat exchange of the refrigerant and air which circulate through the inside of the heat exchanger 3 for cooling, and evaporating a refrigerant, the heat exchanger 3 for cooling is an evaporator which cools air, and is a heat exchanger of the low-tension side of a well-known steamy compression equation refrigerating cycle.

[0007] It is the heat exchanger for heating which heats the air which 4 made the heat source waste heat (cooling water) of the internal combustion engine for transit (engine), and passed the heat exchanger 3 for cooling, and 5 is a bypass path which the heat exchanger 4 for heating is bypassed [path] and circulates air. And an air-capacity rate with the warm air heated by passing the cold blast and the heat exchanger 4 for heating which circulate the bypass path 5 by the air mix door 6 is adjusted, and the temperature of the air which blows off to the vehicle interior of a room is adjusted.

[0008] In addition, cold blast and warm air circulate towards each opening mentioned later, after being mixed by the air mix chamber (air mixing plenum) 7 prepared in the air flow downstream of the bypass path 5.

[0009] 8 is defroster opening which supplies the air which blows off towards the windowpane (not shown) of the front face of a car, and this defroster opening 8 is opened and closed by differential-gear door 8a. Front seat face opening which supplies the air from which 9 blows off towards front seat crew's upper half of the body, and 10 are foot openings which supply the air which blows off towards crew's

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lower half of the body, and the front seat face opening 9 and the foot opening 10 are changed by the foot face door 20, and are opened and closed.

[0010] As shown in drawing 3, the subcase 11 made of resin (polypropylene etc.) which divides an air duct into two or more (3) is formed, and the 1st air duct 101 and the air duct of a call and the right-and-left both sides of the 1st air duct 101 are hereafter called the 2nd air duct 102 for the air duct of a space center section to the part which stands in a row more directly [the face opening 9 and the foot opening 10] among the air ducts of the air flow downstream than the air mix chamber 7.

[0011] As shown in drawing 2 and 3, the front seat face opening 9 is not formed in the 1st air duct 101, but the backseat face opening 12 which supplies the air which blows off to a way side car back seat at the assembly is formed in it, and this backseat face opening 12 is opened and closed by the backseat face door 30. On the other hand, the front seat face opening 9 is formed in an upper part side, and, as for the 2nd air duct 102, the foot opening 10 for car front seats is formed in the lower part side.

[0012] And as shown in drawing 5 - drawing 7, the foot face door 20 and the backseat face door 30 are the so-called offset doors, it is fixed to the common revolving shaft 13, and the location of the rotation direction of a revolving shaft 13 is shifted about 90 degrees by this example, and these doors 20 and 30 are arranged while shifting the location of the shaft orientations of a revolving shaft 13 and being arranged.

[0013] As the 2nd air duct 102 is interrupted in the interior of the Maine case 1, 2nd Itabe 1c is formed in it, and 2nd free passage opening 102a which makes a part of 2nd air duct 102 is formed in 2nd Itabe 1c. And the foot face door 20 attaches and detaches 2nd Itabe 1c, and opens and closes 2nd free passage opening 102a.

[0014] The gross shape of a subcase 11 is as being shown in drawing 4, as the 1st air duct 101 is interrupted in the interior of a subcase 11, 1st Itabe 111 is formed in it, and 1st free passage opening 101a which makes a part of 1st air duct 101 is formed in 1st Itabe 111. And the backseat face door 30 attaches and detaches 1st Itabe 111, and opens and closes 1st free passage opening 101a. In addition, 112 is a bearing slot where a revolving shaft 13 is inserted. Moreover, 113 is Itabe formed as interrupted the 2nd air duct 102, and encloses 2nd free passage opening 102a with 2nd Itabe 1c of the Maine case 1.

[0015] Although a subcase 11 has the shape of a cube type in which the end face 114 of the side which touches 1d of wall surfaces of the Maine case 1 carried out opening and mold omission is performed toward the opening end-face 114 side of a subcase 11 in this case like the arrow head F of drawing 4 at the time of molding of a subcase 11 If it is going to extract a mold like a party in the direction of F after forming 1st free passage opening 101a, at least part I shown in the end side of 1st free passage opening 101a, i.e., drawing 4, and drawing 5 with a two-dot chain line cannot form 1st Itabe 111 in a.

[0016] Thus, when at least part I cannot form Itabe in a and the backseat face door 30 closes 1st free passage opening 101a in contact with 1st Itabe 111, wind leakage arises from 1d of wall surfaces of the Maine case 1 which forms the 1st air duct 101 with a subcase 11, and the clearance between revolving shafts 13 like an arrow head G (refer to drawing 7).

[0017] On the other hand, if at least part I tends to form Itabe of a in the Maine case 1, interference with the foot face door 20 will pose a problem as follows.

[0018] Namely, mold omission at the time of molding is carried out to the shaft orientations of the revolving shaft 13 in the condition that the right-and-left cases 1a and 1b which constitute the Maine case 1 attached the revolving shaft 13, and, as for right case 1a, mold omission is performed toward the direction of arrow-head H of drawing 5 among the right-and-left cases 1a and 1b. Therefore, if at least part I tends to fabricate Itabe of a like a party in the Maine case 1 in the case of this direction of mold omission, Itabe will be formed also in b at least for part II shown in drawing 6 and drawing 7 with a two-dot chain line.

[0019] And b has at least this part II in the actuation range of the foot face door 20 which is one door of an offset door, therefore if Itabe is formed also in b, it will interfere at least in part II with the foot face door 20, and the original function (closing motion function of a path) as a path switchgear is no longer obtained.

[0020] This invention was made in view of the above-mentioned point, and it aims at enabling

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prevention of the wind leakage from the part of the revolving shaft of an offset door, securing the closing motion function of a path in the path switchgear using an offset door.

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MEANS

[Means for Solving the Problem] In order to attain the above-mentioned object, in invention according to claim 1 The Maine case (1) where a fluid flows the interior, and the subcase arranged in the Maine case (1) as it was formed in the Maine case (1) and another object and the end side (114) touched the 1st wall surface (1d) of the Maine case (1) (11), Near the 1st wall surface (1d) by the 1st wall surface (1d), the revolving shaft (13) arranged at abbreviation parallel and the 1st wall surface (1d), and the subcase (11) The 1st fluid channel formed inside the subcase (11) (101), As opposed to the 1st fluid channel (101) to the shaft orientations of a revolving shaft (13) at juxtaposition And the 2nd fluid channel formed in the outside of a subcase (11) (102), With Itabe formed in the Maine case (1) and the subcase (11) as interrupted the 1st and 2nd fluid channel (101 102), respectively (111, 113, 1c) Free passage opening which is formed in Itabe (111, 113, 1c), and constitutes a part of 1st and 2nd fluid channel (101 102) (101a, 102a), While being fixed to a revolving shaft (13) and fixed to a revolving shaft (13) with the 1st door (30) of the tabular cantilever type which attaches and detaches Itabe (111), and opens and closes free passage opening (101a) in the 1st fluid channel (101) To the 1st door (30), shift the location of the shaft orientations of a revolving shaft (13), and the rotation direction of a revolving shaft (13), and it is arranged. And it is a path switchgear equipped with the 2nd door (20) of the tabular cantilever type which attaches and detaches Itabe (113 1c), and opens and closes free passage opening (102a) in the 2nd fluid channel (102). The field of the side which touches Itabe (111) in the 1st door (30) is equipped with packing (302) for seals. When packing (302) touches Itabe (111), it is characterized by extending packing (302) from the revolving shaft (13) at the 1st wall surface (1d) side so that the edge by the side of the 1st wall surface (1d) in packing (302) may touch the 1st wall surface (1d).

[0022] According to this, in a path switchgear equipped with the 1st and 2nd door which shifted the location of the shaft orientations of a revolving shaft 13, and the rotation direction of a revolving shaft, and has been arranged, when the edge of packing 302 touches the 1d of the 1st wall surface of the Maine case 1 at the time of the clausilium of the 1st door 30, the wind leakage from the clearance between 1d of wall surfaces and a revolving shaft 13 can be prevented.

[0023] By the way, as mentioned above, when at least part I shown in drawing 4 and drawing 5 with a two-dot chain line tends to form Itabe in a and it is going to prevent the wind leakage from the clearance between 1d of wall surfaces, and a revolving shaft 13, Itabe will be formed in b at least for part II shown in drawing 6 and drawing 7 with a two-dot chain line due to the direction of mold omission of the Maine case 1. And Itabe of b interferes at least in part II with the 2nd door 20, and the original function (closing motion function of a path) as a path switchgear is no longer obtained.

[0024] On the other hand, in invention according to claim 1, since it is the configuration of extending packing 302 to 1d side of the 1st wall surface, and preventing wind leakage rather than a revolving shaft 13, it becomes unnecessary at least for part I to form Itabe in a, and since Itabe is no longer formed in b at least for part II in connection with it, the problem of interference with Itabe of b only of the 2nd door 20 and part II is lost.

[0025] Therefore, in the path switchgear using an offset door, the wind leakage from the part of the revolving shaft 13 of an offset door can be prevented, securing the closing motion function of a path.

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[0026] The Maine case where a fluid flows the interior in invention according to claim 3 (1), The subcase arranged in the Maine case (1) as it was formed in the Maine case (1) and another object and the end side (114) touched the 1st wall surface (1d) of the Maine case (1) (11), Near the 1st wall surface (1d) by the 1st wall surface (1d), the revolving shaft (13) arranged at abbreviation parallel and the 1st wall surface (1d), and the subcase (11) The 1st fluid channel formed inside the subcase (11) (101), As opposed to the 1st fluid channel (101) to the shaft orientations of a revolving shaft (13) at juxtaposition And the 2nd fluid channel formed in the outside of a subcase (11) (102), With Itabe formed in the Maine case (1) and the subcase (11) as interrupted the 1st and 2nd fluid channel (101 102), respectively (111, 113, 1c) Free passage opening which is formed in Itabe (111, 113, 1c), and constitutes a part of 1st and 2nd fluid channel (101 102) (101a, 102a), While being fixed to a revolving shaft (13) and fixed to a revolving shaft (13) with the 1st door (30) of the tabular cantilever type which attaches and detaches Itabe (111), and opens and closes free passage opening (101a) in the 1st fluid channel (101) To the 1st door (30), shift the location of the shaft orientations of a revolving shaft (13), and the rotation direction of a revolving shaft (13), and it is arranged. And it is a path switchgear equipped with the 2nd door (20) of the tabular cantilever type which attaches and detaches Itabe (113 1c), and opens and closes free passage opening (102a) in the 2nd fluid channel (102). It is characterized by preparing the seal member (303) which carries out the seal of between a revolving shaft (13) and the 1st wall surface (1d) between a revolving shaft (13) and the 1st wall surface (1d).

[0027] According to this, the wind leakage from the clearance between 1d of wall surfaces and a revolving shaft 13 can be prevented by the seal member 303 prepared between a revolving shaft 13 and the 1d of the 1st wall surface.

[0028] Moreover, since it is the configuration of preventing wind leakage by the above-mentioned seal member 303, Itabe of b only of part II which shows at least part I shown in drawing 4 and drawing 5 with a two-dot chain line to a and drawing 6, and drawing 7 with a two-dot chain line is lost, and the problem of the interference only to the 2nd door 20 and part II of an offset door with Itabe of b of it is lost.

[0029] Therefore, in the path switchgear using an offset door, the wind leakage from the part of the revolving shaft 13 of an offset door can be prevented, securing the closing motion function of a path.

[0030] In addition, the sign in the parenthesis of each above-mentioned means shows response relation with the concrete means of a publication to the operation gestalt mentioned later.

[0031]

[Embodiment of the Invention] (The 1st operation gestalt) Drawing 8 - drawing 11 show the 1st operation gestalt, and this operation gestalt applies the path switchgear concerning this invention to the air conditioner for cars. And since the whole air-conditioner configuration and actuation are the same as that of the air conditioner shown in drawing 1 - drawing 3, here explains them based on drawing about the part about a path switchgear. In addition, the I-I sectional view of drawing 9 and drawing 11 of C view drawing and drawing 10 as which drawing 8 looked at the perspective view of a subcase, and drawing 9 looked at near the subcase from [of drawing 1] C are J view drawings of drawing 9.

[0032] As shown in drawing 9 - drawing 11, near the 1d (the 1st wall surface) of the wall surfaces by the side of the car back in the Maine case 1 made of resin (polypropylene etc.), a revolving shaft 13 is arranged to 1d of wall surfaces, abbreviation parallel, and a horizontal direction, and this revolving shaft 13 is supported free [a revolution] in bearing (graphic display abbreviation) of the Maine case 1, or the bearing slot 112 of a subcase 11.

[0033] The backseat face door (the 1st door) 30 of a tabular cantilever type and the foot face door (the 2nd door) 20 of a tabular cantilever type are being fixed to the revolving shaft 13, the location of the rotation direction of a revolving shaft 13 is shifted about 90 degrees by this example, and these doors 20 and 30 are arranged while shifting the location of the shaft orientations of a revolving shaft 13 and being arranged.

[0034] The subcase 11 made of resin (polypropylene etc.) which divides this air duct into the air duct of the air flow downstream two or more (3) is arranged from the air mix chamber 7 within the Maine case 1.

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[0035] The opening end face 114 of this subcase 11 is in contact with 1d of wall surfaces, and the 1st air duct (the 1st fluid channel) 101 is formed inside the subcase 11 of a subcase 11 and 1d of wall surfaces. On the other hand, the 2nd air duct 102 (the 2nd fluid channel) is formed in juxtaposition to the 1st air duct (the 1st fluid channel) 101 on the outside (both sides of a subcase 11) of a subcase 11 at the shaft orientations of a revolving shaft 13.

[0036] As the 2nd air duct 102 is interrupted in the interior of the Maine case 1, 2nd Itabe 1c is formed in it, and 2nd free passage opening 102a which makes a part of 2nd air duct 102 is formed in 2nd Itabe 1c. And the foot face door 20 attaches and detaches 2nd Itabe 1c, and opens and closes 2nd free passage opening 102a.

[0037] As the 1st air duct 101 is interrupted in the interior of a subcase 11, 1st Itabe 111 is formed in it, and 1st free passage opening 101a which makes a part of 1st air duct 101 is formed in 1st Itabe 111. And the backseat face door 30 attaches and detaches 1st Itabe 111, and opens and closes 1st free passage opening 101a.

[0038] In addition, 112 is a bearing slot where a revolving shaft 13 is inserted. Moreover, 113 is Itabe formed as interrupted the 2nd air duct 102, and encloses 2nd free passage opening 102a with 2nd Itabe 1c of the Maine case 1. Moreover, height 1e which is prolonged in a revolving shaft 13 and parallel, and projects toward a revolving-shaft 13 side is formed in 1d of wall surfaces of the Maine case 1, and the notch 115 is formed in the opening end face 114 of a subcase 11 in order to avoid interference with height 1e.

[0039] Especially the backseat face door 30 consists of the substrate section 301 which consists of rigid high construction material (resin, such as polypropylene) comparatively, and packing 302 for seals which consists of porosity foam (for example, urethane foam) so that clearly from drawing 11 .

[0040] The substrate section 301 consists of main substrate section 301a to which the backseat face door 30 extends in 1d side of anti-wall surfaces rather than a revolving shaft 13 on the basis of the location (condition of drawing 11) which closed 1st free passage opening 101a, and extension 301b prolonged in 1d side of wall surfaces rather than a revolving shaft 13. Moreover, the substrate section 301 is offset from the axis of a revolving shaft 13, and is a revolving shaft 13 and really fabricated, and the whole surface of the side which touches Itabe 111 in the substrate section 301 is a flat surface.

[0041] And when it is equipped with packing 302 all over the side which touches Itabe 111 in the substrate section 301 (pasting) and the backseat face door 30 closes 1st free passage opening 101a, end-face 302a by the side of 1d of wall surfaces of packing 302 contacts height 1e.

[0042] According to this above-mentioned operation gestalt, by extending the packing 302 of the backseat face door 30 to 1d side of wall surfaces rather than a revolving shaft 13 When the packing 302 of the backseat face door 30 closes 1st free passage opening 101a in contact with Itabe 111 Since he is trying for end-face 302a by the side of 1d of wall surfaces of packing 302 to contact height 1e, the wind leakage from the clearance between 1d of wall surfaces of the Maine case 1 and a revolving shaft 13 can be prevented.

[0043] Moreover, since it is the configuration of extending packing 302 to 1d side of wall surfaces, and preventing wind leakage rather than a revolving shaft 13, it becomes unnecessary at least for part II which shows at least part I shown in drawing 4 and drawing 5 with a two-dot chain line to a and drawing 6 , and drawing 7 with a two-dot chain line to form Itabe in b, and the problem of the interference only to the foot face door 20 and part II with Itabe of b of it is lost.

[0044] In addition, although height 1e is formed to the installation range of the foot face door 20, since the packing 302 of the backseat face door 30 is extended to 1d side of wall surfaces rather than a revolving shaft 13 and the projection height of height 1e is made low, there is no interference with height 1e and the foot face door 20 on shaping of the Maine case 1.

[0045] Therefore, in the path switchgear using an offset door, the wind leakage from between 1d of wall surfaces of the Maine case 1 and the revolving shafts 13 of an offset door can be prevented, securing the closing motion function of a path.

[0046] (The 2nd operation gestalt) Although the wind leakage from the clearance between 1d of wall surfaces of the Maine case 1 and a revolving shaft 13 was prevented with the above-mentioned 1st

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operation gestalt by making end-face 302a by the side of 1d of wall surfaces of packing 302 contact height 1e Height 1e is abolished and you may make it make end-face 302a by the side of 1d of wall surfaces of packing 302 contact 1d of wall surfaces of the Maine case 1 directly like the 2nd operation gestalt shown in drawing 12 .

[0047] According to this operation gestalt, in the path switchgear using an offset door, the wind leakage from between 1d of wall surfaces of the Maine case 1 and the revolving shafts 13 of an offset door can be prevented like the 1st operation gestalt, securing the closing motion function of a path.

[0048] (The 3rd operation gestalt) Further, like the 3rd operation gestalt shown in drawing 13 , while abolishing height 1e When 1f of slanting sides is formed in 1d of wall surfaces of the Maine case 1 and the backseat face door 30 closes 1st free passage opening 101a, you may make it make the corner of end-face 302a by the side of 1d of wall surfaces of packing 302 contact 1f of slanting sides.

[0049] According to this operation gestalt, in the path switchgear using an offset door, the wind leakage from between 1d of wall surfaces of the Maine case 1 and the revolving shafts 13 of an offset door can be prevented like the 1st operation gestalt, securing the closing motion function of a path.

[0050] (The 4th operation gestalt) Drawing 14 shows the 4th operation gestalt, and by the seal member 303 which extended the end of packing 302, the peripheral face of a revolving shaft 13 is located in a bonnet, and it is locating the seal member 303 between a revolving shaft 13 and 1d of wall surfaces of the Maine case 1. Thereby, the peripheral face of the seal member 303 contacts 1d of wall surfaces of the Maine case 1, and carries out the seal of between a revolving shaft 13 and 1d of wall surfaces.

[0051] According to this operation gestalt, in the path switchgear using an offset door, the wind leakage from between 1d of wall surfaces of the Maine case 1 and the revolving shafts 13 of an offset door can be prevented like the 1st operation gestalt, securing the closing motion function of a path.

[0052] (Other operation gestalten) With the above-mentioned 4th operation gestalt, although the revolving shaft 13 was equipped with the seal member 303, 1d of wall surfaces of the Maine case 1 may be equipped with a seal member. In this case, locate a seal member between a revolving shaft 13 and 1d of wall surfaces of the Maine case 1, a seal member is made to contact the peripheral face of a revolving shaft 13, and the seal of between a revolving shaft 13 and 1d of wall surfaces is carried out.

[0053] Moreover, with an above-mentioned operation gestalt, although the operation gestalt of this invention was explained to the example for the air conditioner for cars, this invention can apply other fluid channels also to the equipment which carries out change-over closing motion, without being limited to this.

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DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]

[Drawing 1] It is a mimetic diagram in the A-A cross section of drawing 3 in the air conditioner for cars containing the path switchgear which this invention persons are developing.

[Drawing 2] It is a mimetic diagram in the B-B cross section of drawing 3.

[Drawing 3] It is the front view of drawing 1 and the air conditioner for cars of drawing 2.

[Drawing 4] It is the perspective view of the subcase of drawing 3.

[Drawing 5] It is C view drawing which looked at near the subcase from [of drawing 1] C.

[Drawing 6] It is the D-D sectional view of drawing 5.

[Drawing 7] It is E view drawing of drawing 5.

[Drawing 8] It is the perspective view of a subcase in the air conditioner for cars using the path switchgear concerning the 1st operation gestalt of this invention.

[Drawing 9] It is C view drawing which looked at near the subcase of drawing 8 from [of drawing 1] C.

[Drawing 10] It is the I-I sectional view of drawing 9.

[Drawing 11] It is J view drawing of drawing 9.

[Drawing 12] It is the sectional view of the important section of air-conditioner drawing for cars using the path switchgear concerning the 2nd operation gestalt of this invention.

[Drawing 13] It is the sectional view of the important section of air-conditioner drawing for cars using the path switchgear concerning the 3rd operation gestalt of this invention.

[Drawing 14] It is the sectional view of the important section of air-conditioner drawing for cars using the path switchgear concerning the 4th operation gestalt of this invention.

[Description of Notations]

1 [-- The end face of a subcase 13 / -- A revolving shaft, 101 / -- The 1st air duct, 101a / -- The 1st free passage opening, 102 / -- The 2nd air duct, 102a / -- The 2nd free passage opening, 111, 113, 1c / -- Itabe, 20 / -- A foot face door, 30 / -- A backseat face door, 302 / -- Packing.] -- The Maine case, 1d -- The wall surface of the Maine case, 11 -- A subcase, 114

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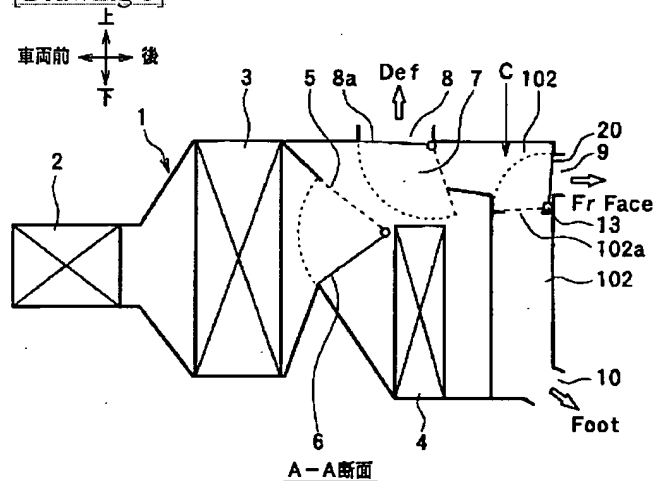
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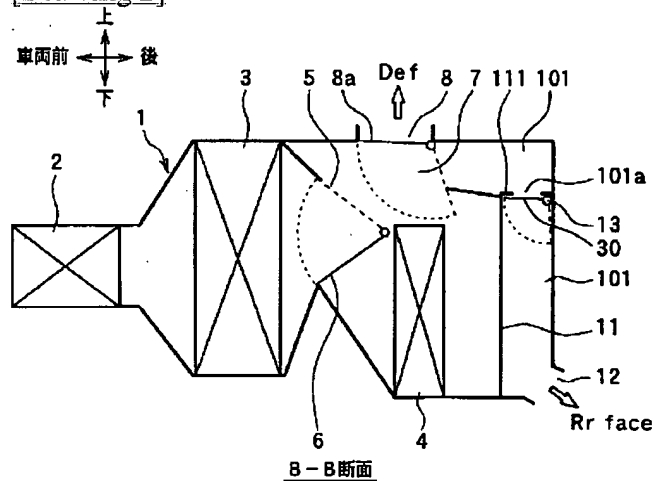
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DRAWINGS

[Drawing 1]

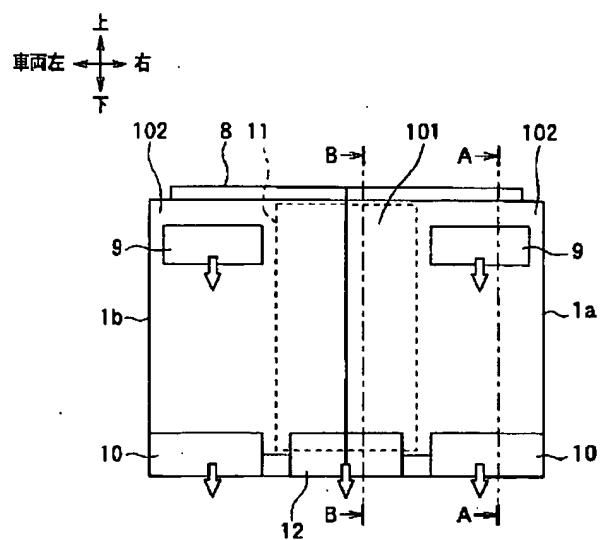


[Drawing 2]

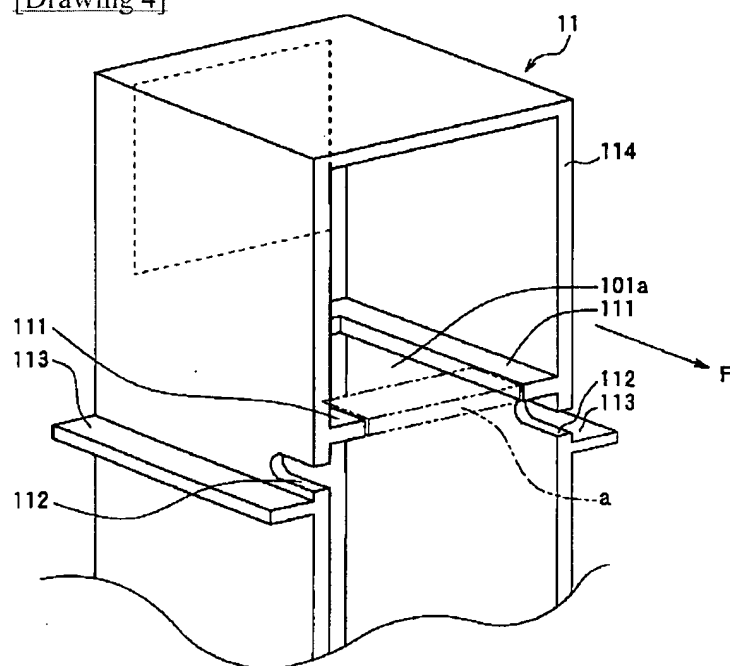


[Drawing 3]

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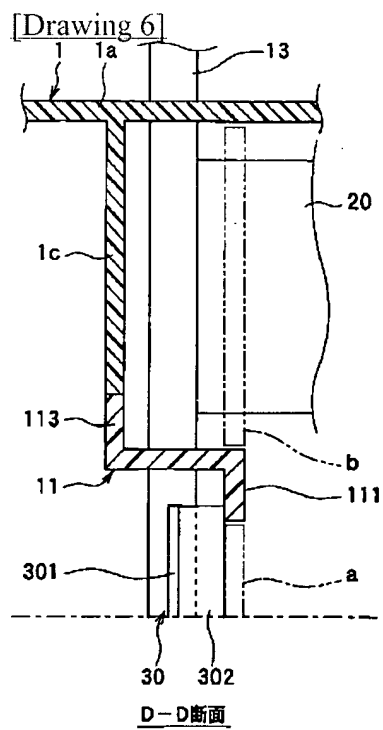
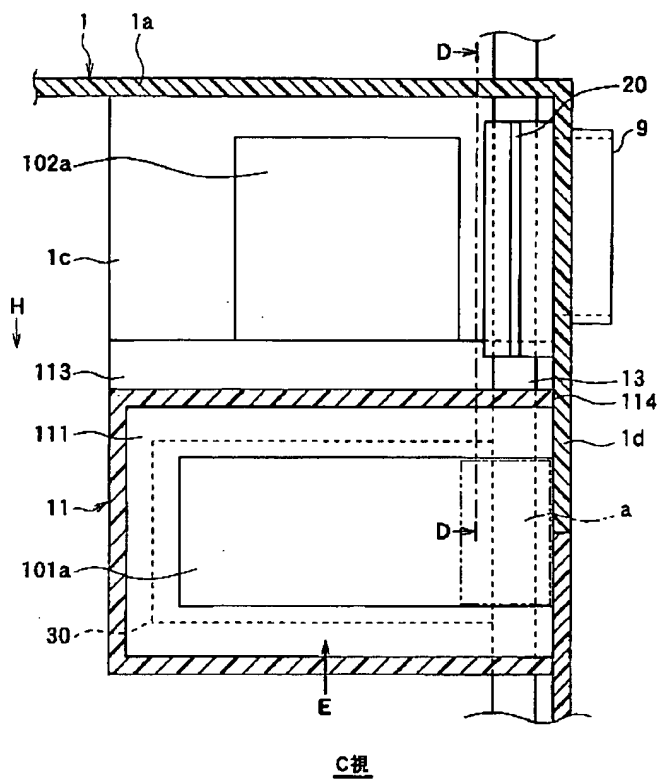


[Drawing 4]



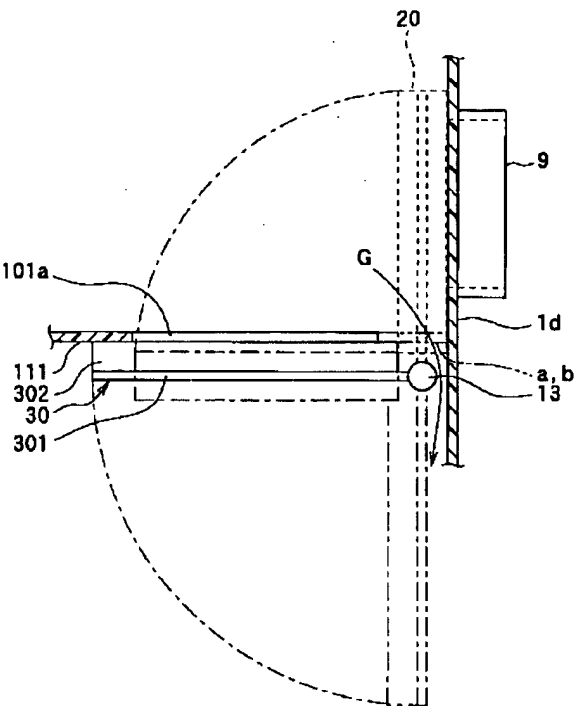
[Drawing 5]

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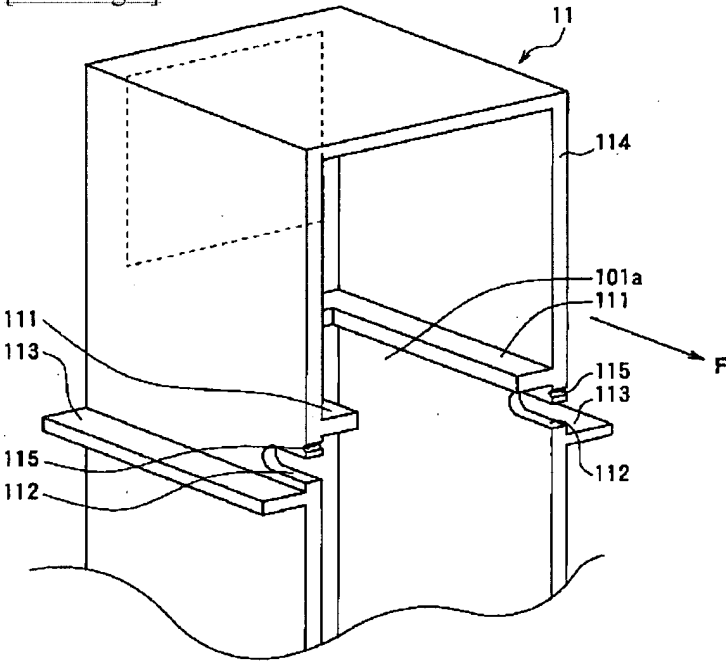
[Drawing 7]

THE DATE OF MY DEATH



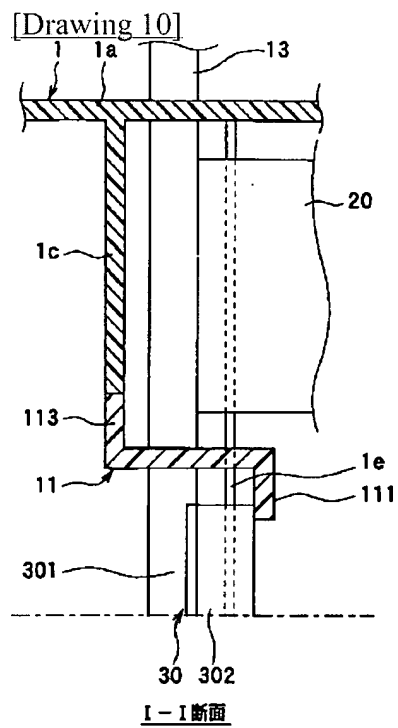
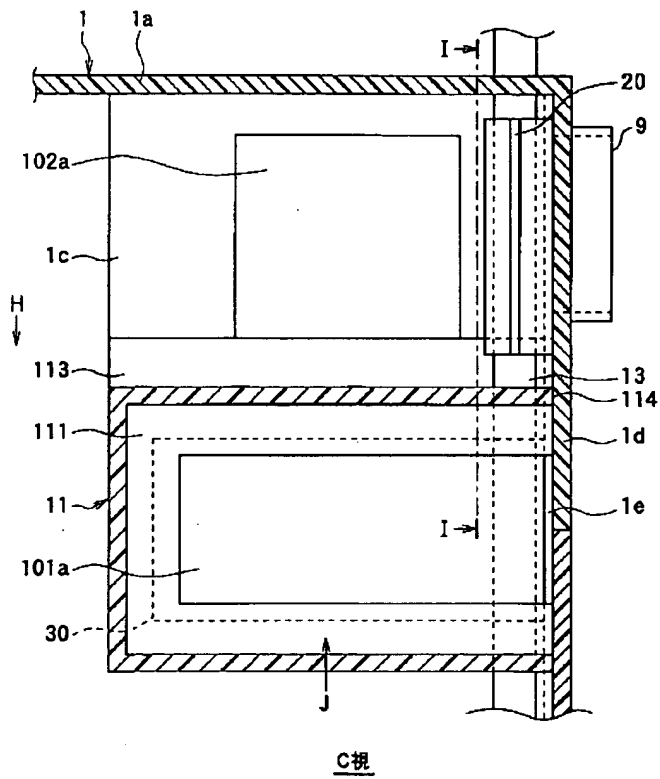
E 視

[Drawing 8]



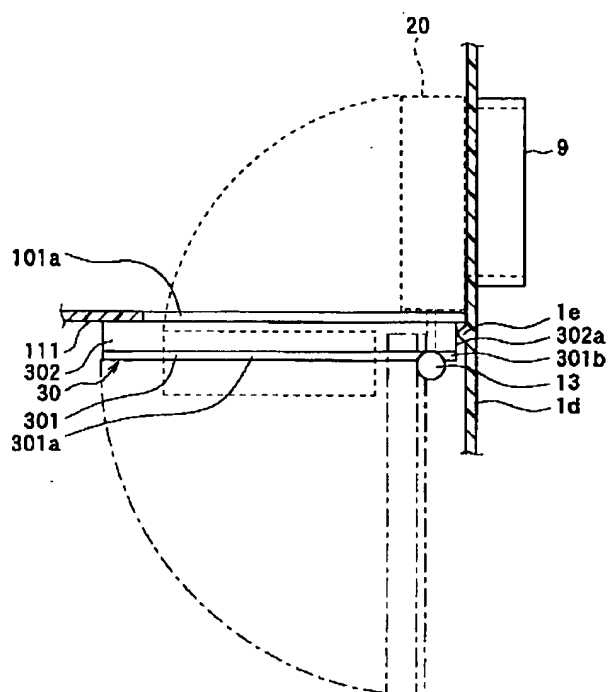
[Drawing 9]

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[Drawing 11]

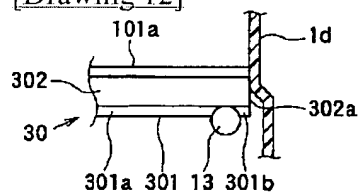
THE FINE LINE (1979)



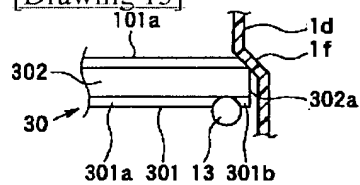
J 視

1d : メインケースの壁面	114 : サブケースの端面
13 : 回転軸	101a : 第1 連通口
111 : 板部	20 : フットフェイスドア
30 : 後席フェイスドア	302 : パッキン

[Drawing 12]

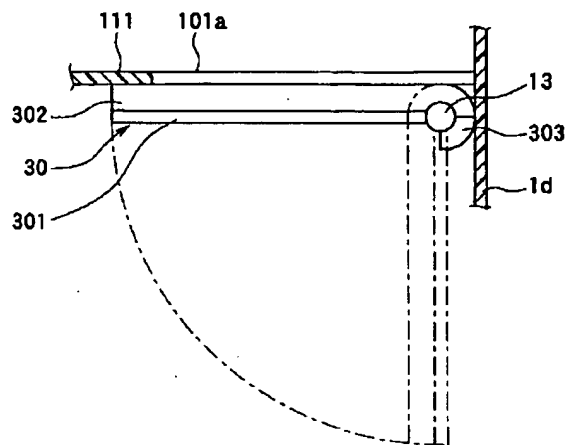


[Drawing 13]



[Drawing 14]

NO MORE BLANK (GPT)



[Translation done.]

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PATENT ABSTRACTS OF JAPAN

(11)Publication number : 2002-114021

(43)Date of publication of application : 16.04.2002

51)Int.Cl.

B60H 1/00

21)Application number : 2000-309618

(71)Applicant : DENSO CORP

22)Date of filing : 10.10.2000

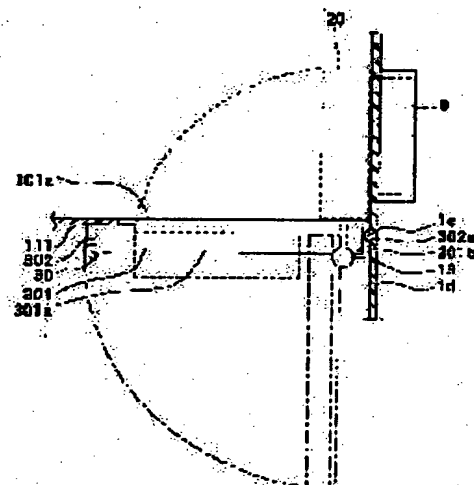
(72)Inventor : KADOOKA TATSUO
MOCHIZUKI KEISHIN
SUGATA YASUSHI

54) PASSAGE OPENING/CLOSING DEVICE AND VEHICULAR AIR CONDITIONER

57)Abstract:

PROBLEM TO BE SOLVED: To prevent a wind leakage from the portion of a rotary shaft of offset doors while securing the opening/closing function of a passage in a passage opening/closing device using the offset doors.

SOLUTION: This passage opening/closing device is provided with two doors 20 and 30, with their positions in the axial direction of the rotary shaft 13 and the rotating direction of the rotary shaft 13 displacedly arranged. The packing 302 of the first door 30 is extended to the wall face 1d side of a main case 1 from the rotary shaft 13, the end section of the packing 302 is kept in contact with the wall face 1d when the first door 30 is closed, thereby a wind leakage from the gap between the wall face 1d and the rotary shaft 13 is prevented.



1d :メインケースの壁面
13 :回転軸
111 :密封部
30 :第1扉体
114 :サブケースの壁面
302a :第1密封部
302b :第2密封部
302c :第3密封部
302d :第4密封部
302e :第5密封部
302f :第6密封部
302g :第7密封部
302h :第8密封部
302i :第9密封部
302j :第10密封部
302k :第11密封部
302l :第12密封部
302m :第13密封部
302n :第14密封部
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(1000) 1111-1111 (1000)

(19) 日本国特許庁 (J P)

(12) 公開特許公報 (A)

(11) 特許出願公開番号

特開2002-114021

(P2002-114021A)

(43) 公開日 平成14年4月16日 (2002.4.16)

(51) Int.Cl.
B 6 0 H 1/00識別記号
1 0 2F I
B 6 0 H 1/00

テマコード (参考)

1 0 2 J 3 L 0 1 1
1 0 2 L

審査請求 未請求 請求項の数 8 O L (全 10 頁)

(21) 出願番号 特願2000-309618(P2000-309618)

(22) 出願日 平成12年10月10日 (2000.10.10)

(71) 出願人 000004260

株式会社デンソー

愛知県刈谷市昭和町1丁目1番地

(72) 発明者 角岡 辰夫

愛知県刈谷市昭和町1丁目1番地 株式会
社デンソー内

(72) 発明者 望月 佳信

愛知県刈谷市昭和町1丁目1番地 株式会
社デンソー内

(74) 代理人 100100022

弁理士 伊藤 祥二 (外2名)

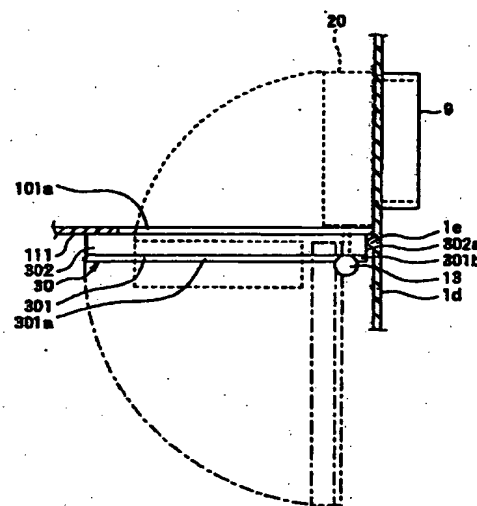
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(54) 【発明の名称】 通路開閉装置および車両用空調装置

(57) 【要約】

【課題】 オフセットドアを用いる通路開閉装置において、通路の開閉機能を確保しつつ、オフセットドアの回転軸の部位からの風漏れを防止する。

【解決手段】 回転軸13の軸方向および回転軸13の回転方向の位置をずらして配置された2枚のドア20、30を備える通路開閉装置において、回転軸13よりもメインケース1の壁面1d側まで、第1ドア30のパッキン302を延長し、第1ドア30の閉弁時にはパッキン302の端部が壁面1dに接することにより、壁面1dと回転軸13との隙間からの風漏れを防止する。



J 図

1d:メインケースの壁面
13:回転軸
111:扉部
30:後扉フェイスドア

114:サブケースの壁面
101a:扉1通過口
20:フロントフェイスドア
302:パッキン

(2)

【特許請求の範囲】

【請求項1】 内部を流体が流れるメインケース（1）と、

前記メインケース（1）と別体に形成され、一端面（114）が前記メインケース（1）の第1壁面（1d）に接するようにして前記メインケース（1）内に配置されたサブケース（11）と、

前記第1壁面（1d）の近傍にて前記第1壁面（1d）と略平行に配置された回転軸（13）と、

前記第1壁面（1d）と前記サブケース（11）とにより、前記サブケース（11）の内側に形成された第1流体通路（101）と、

前記第1流体通路（101）に対して前記回転軸（13）の軸方向に並列に、かつ、前記サブケース（11）の外側に形成された第2流体通路（102）と、

前記第1、第2流体通路（101、102）をそれぞれ遮るようにして前記メインケース（1）および前記サブケース（11）に形成された板部（111、113、1c）と、

前記板部（111、113、1c）に形成されて、前記第1、第2流体通路（101、102）の一部を構成する連通口（101a、102a）と、

前記回転軸（13）に固定され、前記板部（111）と接離して前記第1流体通路（101）中の連通口（101a）を開閉する板状の片持ち式の第1ドア（30）と、

前記回転軸（13）に固定されるとともに、前記第1ドア（30）に対して回転軸（13）の軸方向および前記回転軸（13）の回転方向の位置をずらして配置され、かつ、前記板部（113、1c）と接離して前記第2流体通路（102）中の連通口（102a）を開閉する板状の片持ち式の第2ドア（20）を備える通路開閉装置であって、

前記第1ドア（30）において前記板部（111）と接する側の面にシール用のパッキン（302）を備え、前記パッキン（302）が前記板部（111）と接した際に前記パッキン（302）における前記第1壁面（1d）側の端部が前記第1壁面（1d）に接するように、前記パッキン（302）が前記回転軸（13）よりも前記第1壁面（1d）側まで延長されていることを特徴とする通路開閉装置。

【請求項2】 前記第1ドア（30）は前記回転軸（13）に連結された基板部（301）を有し、前記基板部（301）は前記回転軸（13）よりも前記第1壁面（1d）側まで延長され、前記基板部（301）に前記パッキン（302）が装着されていることを特徴とする請求項1に記載の通路開閉装置。

【請求項3】 内部を流体が流れるメインケース（1）と、

前記メインケース（1）と別体に形成され、一端面（1

2

14）が前記メインケース（1）の第1壁面（1d）に接するようにして前記メインケース（1）内に配置されたサブケース（11）と、

前記第1壁面（1d）の近傍にて前記第1壁面（1d）と略平行に配置された回転軸（13）と、

前記第1壁面（1d）と前記サブケース（11）とにより、前記サブケース（11）の内側に形成された第1流体通路（101）と、

前記第1流体通路（101）に対して前記回転軸（13）の軸方向に並列に、かつ、前記サブケース（11）の外側に形成された第2流体通路（102）と、

前記第1、第2流体通路（101、102）をそれぞれ遮るようにして前記メインケース（1）および前記サブケース（11）に形成された板部（111、113、1c）と、

前記板部（111、113、1c）に形成されて、前記第1、第2流体通路（101、102）の一部を構成する連通口（101a、102a）と、

前記回転軸（13）に固定され、前記板部（111）と接離して前記第1流体通路（101）中の連通口（101a）を開閉する板状の片持ち式の第1ドア（30）と、

前記回転軸（13）に固定されるとともに、前記第1ドア（30）に対して回転軸（13）の軸方向および前記回転軸（13）の回転方向の位置をずらして配置され、かつ、前記板部（113、1c）と接離して前記第2流体通路（102）中の連通口（102a）を開閉する板状の片持ち式の第2ドア（20）を備える通路開閉装置であって、

前記回転軸（13）と前記第1壁面（1d）との間をシールするシール部材（303）を、前記回転軸（13）と前記第1壁面（1d）との間に設けたことを特徴とする通路開閉装置。

【請求項4】 前記シール部材（303）は前記回転軸（13）の外周面を覆っていることを特徴とする請求項3に記載の通路開閉装置。

【請求項5】 前記シール部材（303）は前記第1壁面（1d）に装着されていることを特徴とする請求項3に記載の通路開閉装置。

【請求項6】 前記サブケース（11）は樹脂成形され、前記サブケース（11）の一端面（114）に向かって成型時の型抜きが行われることを特徴とする請求項1ないし5のいずれか1つに記載の通路開閉装置。

【請求項7】 前記メインケース（1）は樹脂成形され、前記回転軸（13）を組み付けた状態における前記回転軸（13）の軸方向に、前記メインケース（1）の成型時の型抜きが行われることを特徴とする請求項1ないし6のいずれか1つに記載の通路開閉装置。

【請求項8】 請求項1ないし7のいずれか1つに記載の通路開閉装置を用いた車両用空調装置であって、

(3)

3

空気を冷却する冷房用熱交換器(3)と空気を加熱する暖房用熱交換器(4)とを前記メインケース(1)内に備え、

前記第1、第2流体通路(101、102)は前記両熱交換器(3、4)により冷却、加熱された空調風を導く通路であることを特徴とする車両用空調装置。

【発明の詳細な説明】

【0001】

【発明の属する技術分野】本発明は、少なくとも2本の流体通路の開閉をオフセットドアにて行う通路開閉装置に関するもので、車両用空調装置に適用して有効である。

【0002】

【従来の技術】並列に配置された2本の流体通路の開閉を行う通路開閉装置においては、回転軸の軸方向および回転軸の回転方向の位置をずらして配置された2枚の片持ち式ドアを有するオフセットドアを用いることがある。

【0003】

【発明が解決しようとする課題】しかしながら、上記のようにオフセットドアを用いる通路開閉装置においては、後述のように、オフセットドアの回転軸とケースとの隙間から風漏れが生じるという問題がある。

【0004】この風漏れが生じる点について、図1～7に基づいて説明する。図1～7は、オフセットドアを用いた通路開閉装置を含む車両用空調装置の模式図で、本発明者らが開発中のものである。ここで、図1、2は空気の流通方向に略平行な断面(図3のA-A断面およびB-B断面)を示しており、図3は空調装置を空気の吹出口側から見た模式図、図4はサブケースの斜視図、図5はサブケース付近を図1のC方向から見たC矢視図、図6は図5のD-D断面図、図7は図5のE矢視図である。

【0005】図1、図2において、1は空気が流通する空気通路を構成するとともに、後述する冷房用熱交換器3や暖房用熱交換器4等の空調用機器を収納する樹脂(ポリプロピレン等)製のメインケースであり、このメインケース1の空気流れ上流側には、車室内の空気及び車室外の空気を選択的に導入することができる内外気切換装置(図示せず。)が設けられている。なお、図3に示すように、メインケース1は、車両左右方向に分割された右ケース1aと左ケース1bとからなる。

【0006】そして、内外気切換装置の空気流れ下流側には遠心式の送風機2が設けられ、この送風機2の空気流れ下流側には、送風機2から送風された空気を冷却する冷房用熱交換器3が配設されている。なお、冷房用熱交換器3は、冷房用熱交換器3内を循環する冷媒と空気とを熱交換させて冷媒を蒸発させることにより空気を冷却する蒸発器で、周知の蒸気圧縮式冷凍サイクルの低圧側の熱交換器である。

4

【0007】4は走行用の内燃機関(エンジン)の廃熱(冷却水)を熱源として冷房用熱交換器3を通過した空気を加熱する暖房用熱交換器であり、5は暖房用熱交換器4を迂回して空気を流通させるバイパス通路である。そして、エアミックスドア6により、バイパス通路5を流通する冷風と暖房用熱交換器4を通過して加熱された温風との風量割合を調節し、車室内に吹き出す空気の温度を調節している。

【0008】なお、冷風と温風とは、バイパス通路5の空気流れ下流側に設けられたエアミックスチャンバ(空気混合室)7にて混合された後、後述する各開口部に向けて流通する。

【0009】8は車両前面の窓ガラス(図示せず。)に向けて吹き出す空気を供給するデフロスタ開口部であり、このデフロスタ開口部8はデフドア8aにより開閉される。9は前席乗員の上半身に向けて吹き出す空気を供給する前席フェイス開口部、10は乗員の下半身に向けて吹き出す空気を供給するフット開口部であり、前席フェイス開口部9とフット開口部10は、フットフェイスドア20により切り替え開閉される。

【0010】エアミックスチャンバ7より空気流れ下流側の空気通路のうち、フェイス開口部9及びフット開口部10に直接に連なる部位には、図3に示すように、空気通路を複数本(3本)に仕切る樹脂(ポリプロピレン等)製のサブケース11が設けられており、以下、紙面中央部の空気通路を第1空気通路101と呼び、第1空気通路101の左右両側の空気通路を第2空気通路102と呼ぶ。

【0011】第1空気通路101には、図2、3に示すように、前席フェイス開口部9は設けられておらず、車両後部座席上方側に吹き出す空気を供給する後席フェイス開口部12が設けられ、この後席フェイス開口部12は、後席フェイスドア30により開閉される。一方、第2空気通路102は上方側に前席フェイス開口部9が設けられ、下方側に車両前席用のフット開口部10が設けられている。

【0012】そして、図5～図7に示すように、フットフェイスドア20と後席フェイスドア30は、いわゆるオフセットドアであって、共通の回転軸13に固定されており、これらのドア20、30は回転軸13の軸方向の位置をずらして配置されるとともに、回転軸13の回転方向の位置を本例では約90度ずらして配置されている。

【0013】メインケース1の内部には、第2空気通路102を遮るようにして第2板部1cが形成され、第2板部1cには第2空気通路102の一部をなす第2連通口102aが形成されている。そして、フットフェイスドア20が第2板部1cと接離して第2連通口102aを開閉するようになっている。

【0014】サブケース11の概略形状は図4に示す通

(4)

5

りで、サブケース 11 の内部には、第 1 空気通路 101 を遮るようにして第 1 板部 111 が形成され、第 1 板部 111 には第 1 空気通路 101 の一部をなす第 1 連通口 101a が形成されている。そして、後席フェイストア 30 が第 1 板部 111 と接離して第 1 連通口 101a を開閉するようになっている。なお、112 は回転軸 13 が挿入される軸受溝である。また、113 は第 2 空気通路 102 を遮るようにして形成された板部で、メインケース 1 の第 2 板部 1c とともに第 2 連通口 102a を取り囲んでいる。

【0015】サブケース 11 は、メインケース 1 の壁面 1d に接する側の端面 114 が開口した箱形状であり、この場合、サブケース 11 の成型時には、図 4 の矢印 F のようにサブケース 11 の開口端面 114 側に向かって型抜きが行われるが、第 1 連通口 101a を形成したうえで型を F 方向に一行程で抜こうとすると、第 1 連通口 101a の一端側、すなわち図 4、図 5 に二点鎖線で示す第 1 部位 a には第 1 板部 111 を形成することができない。

【0016】このように、第 1 部位 a に板部を形成できない場合、後席フェイストア 30 が第 1 板部 111 に接して第 1 連通口 101a を閉じた際に、サブケース 11 とともに第 1 空気通路 101 を形成するメインケース 1 の壁面 1d と、回転軸 13 との隙間から、矢印 G (図 7 参照) のように風漏れが生じる。

【0017】一方、第 1 部位 a の板部をメインケース 1 に形成しようとする、下記のようにフットフェイストア 20 との干渉が問題となる。

【0018】すなわち、メインケース 1 を構成する左右ケース 1a、1b は、回転軸 13 を組み付けた状態における回転軸 13 の軸方向に成型時の型抜きが行われ、左右ケース 1a、1b のうち右ケース 1a は、図 5 の矢印 H 方向に向かって型抜きが行われる。従って、この型抜き方向の場合、第 1 部位 a の板部をメインケース 1 に一行程で成形しようとする、図 6、図 7 に二点鎖線で示す第 2 部位 b にも板部が形成されてしまう。

【0019】そして、この第 2 部位 b は、オフセットドアの一方のドアであるフットフェイストア 20 の作動範囲にあり、従って、第 2 部位 b にも板部が形成されてしまうとフットフェイストア 20 と干渉してしまい、通路開閉装置としての本来の機能 (通路の開閉機能) が得られなくなる。

【0020】本発明は上記の点に鑑みてなされたもので、オフセットドアを用いる通路開閉装置において、通路の開閉機能を確保しつつ、オフセットドアの回転軸の部位からの風漏れを防止可能にすることを目的とする。

【0021】

【課題を解決するための手段】上記目的を達成するため、請求項 1 に記載の発明では、内部を流体が流れるメインケース (1) と、メインケース (1) と別体に形成

6

され、一端面 (114) がメインケース (1) の第 1 壁面 (1d) に接するようにしてメインケース (1) 内に配置されたサブケース (11) と、第 1 壁面 (1d) の近傍にて第 1 壁面 (1d) と略平行に配置された回転軸 (13) と、第 1 壁面 (1d) とサブケース (11) とにより、サブケース (11) の内側に形成された第 1 流体通路 (101) と、第 1 流体通路 (101) に対して回転軸 (13) の軸方向に並列に、かつ、サブケース (11) の外側に形成された第 2 流体通路 (102)

と、第 1、第 2 流体通路 (101、102) をそれぞれ遮るようにしてメインケース (1) およびサブケース (11) に形成された板部 (111、113、1c) と、板部 (111、113、1c) に形成されて、第 1、第 2 流体通路 (101、102) の一部を構成する連通口 (101a、102a) と、回転軸 (13) に固定され、板部 (111) と接離して第 1 流体通路 (101) 中の連通口 (101a) を開閉する板状の片持ち式の第 1 ドア (30) と、回転軸 (13) に固定されるとともに、第 1 ドア (30) に対して回転軸 (13) の軸方向および回転軸 (13) の回転方向の位置をずらして配置され、かつ、板部 (113、1c) と接離して第 2 流体通路 (102) 中の連通口 (102a) を開閉する板状の片持ち式の第 2 ドア (20) を備える通路開閉装置であって、第 1 ドア (30) において板部 (111) と接する側の面にシール用のパッキン (302) を備え、パッキン (302) が板部 (111) と接した際にパッキン (302) における第 1 壁面 (1d) 側の端部が第 1 壁面 (1d) に接するように、パッキン (302) が回転軸 (13) よりも第 1 壁面 (1d) 側まで延長されていることを特徴とする。

【0022】これによると、回転軸 13 の軸方向および回転軸の回転方向の位置をずらして配置された第 1、第 2 ドアを備える通路開閉装置において、第 1 ドア 30 の閉弁時にはパッキン 302 の端部がメインケース 1 の第 1 壁面 1d に接することにより、壁面 1d と回転軸 13 との隙間からの風漏れを防止することができる。

【0023】ところで、前述したように、図 4、図 5 に二点鎖線で示す第 1 部位 a に板部を形成して、壁面 1d と回転軸 13 との隙間からの風漏れを防止しようとした場合、メインケース 1 の型抜き方向の関係で、図 6、図 7 に二点鎖線で示す第 2 部位 b に板部が形成されてしまう。そして、第 2 部位 b の板部が第 2 ドア 20 と干渉して、通路開閉装置としての本来の機能 (通路の開閉機能) が得られなくなる。

【0024】これに対し、請求項 1 に記載の発明では、回転軸 13 よりも第 1 壁面 1d 側までパッキン 302 を延長して風漏れを防止する構成であるため、第 1 部位 a に板部を形成する必要がなくなり、それに伴って、第 2 部位 b に板部が形成されなくなるため、第 2 ドア 20 と第 2 部位 b の板部との干渉の問題がなくなる。

(5)

7

【0025】従って、オフセットドアを用いる通路開閉装置において、通路の開閉機能を確保しつつ、オフセットドアの回転軸13の部位からの風漏れを防止することができる。

【0026】請求項3に記載の発明では、内部を流体が流れるメインケース(1)と、メインケース(1)と別体に形成され、一端面(114)がメインケース(1)の第1壁面(1d)に接するようにしてメインケース(1)内に配置されたサブケース(11)と、第1壁面(1d)の近傍にて第1壁面(1d)と略平行に配置された回転軸(13)と、第1壁面(1d)とサブケース(11)とにより、サブケース(11)の内側に形成された第1流体通路(101)と、第1流体通路(101)に対して回転軸(13)の軸方向に並列に、かつ、サブケース(11)の外側に形成された第2流体通路(102)と、第1、第2流体通路(101、102)をそれぞれ遮るようにしてメインケース(1)およびサブケース(11)に形成された板部(111、113、1c)と、板部(111、113、1c)に形成されて、第1、第2流体通路(101、102)の一部を構成する連通口(101a、102a)と、回転軸(13)に固定され、板部(111)と接離して第1流体通路(101)中の連通口(101a)を開閉する板状の片持ち式の第1ドア(30)と、回転軸(13)に固定されるとともに、第1ドア(30)に対して回転軸(13)の軸方向および回転軸(13)の回転方向の位置をずらして配置され、かつ、板部(113、1c)と接離して第2流体通路(102)中の連通口(102a)を開閉する板状の片持ち式の第2ドア(20)を備える通路開閉装置であって、回転軸(13)と第1壁面(1d)との間をシールするシール部材(303)を、回転軸(13)と第1壁面(1d)との間に設けたことを特徴とする。

【0027】これによると、回転軸13と第1壁面1dとの間に設けたシール部材303により、壁面1dと回転軸13との隙間からの風漏れを防止することができる。

【0028】また、上記したシール部材303により風漏れを防止する構成であるため、図4、図5に二点鎖線で示す第1部位aおよび図6、図7に二点鎖線で示す第2部位bの板部がなくなり、オフセットドアの第2ドア20と第2部位bの板部との干渉の問題がなくなる。

【0029】従って、オフセットドアを用いる通路開閉装置において、通路の開閉機能を確保しつつ、オフセットドアの回転軸13の部位からの風漏れを防止することができる。

【0030】なお、上記各手段の括弧内の符号は、後述する実施形態に記載の具体的手段との対応関係を示すものである。

【0031】

8

【発明の実施の形態】(第1実施形態)図8～図11は第1実施形態を示すもので、本実施形態は本発明に係る通路開閉装置を車両用空調装置に適用したものである。そして、空調装置の全体構成および作動は図1～図3に示す空調装置と同一であるため、ここでは、通路開閉装置に関する部分について図に基づいて説明する。なお、図8はサブケースの斜視図、図9はサブケース付近を図1のC方向から見たC矢視図、図10は図9のI-I断面図、図11は図9のJ矢視図である。

【0032】図9～図11に示すように、樹脂(ポリプロピレン等)製のメインケース1における車両後側の壁面(第1壁面)1dの近傍には、壁面1dと略平行かつ水平方向に回転軸13が配置され、この回転軸13は、メインケース1の軸受部(図示省略)やサブケース11の軸受溝112に回転自在に支持されている。

【0033】回転軸13には、板状の片持ち式の後席フェイスドア(第1ドア)30と板状の片持ち式のフットフェイスドア(第2ドア)20が固定されており、これらのドア20、30は回転軸13の軸方向の位置をずらして配置されるとともに、回転軸13の回転方向の位置を本例では約90度ずらして配置されている。

【0034】メインケース1内のエアミックスチャンバ7より空気流れ下流側の空気通路には、この空気通路を複数本(3本)に仕切る樹脂(ポリプロピレン等)製のサブケース11が配置されている。

【0035】このサブケース11の開口端面114が壁面1dに接しており、サブケース11と壁面1dとにより、サブケース11の内側に第1空気通路(第1流体通路)101が形成されている。一方、サブケース11の外側(サブケース11の両側)には、第1空気通路(第1流体通路)101に対して回転軸13の軸方向に並列に第2空気通路102(第2流体通路)が形成されている。

【0036】メインケース1の内部には、第2空気通路102を遮るようにして第2板部1cが形成され、第2板部1cには第2空気通路102の一部をなす第2連通口102aが形成されている。そして、フットフェイスドア20が第2板部1cと接離して第2連通口102aを開閉するようになっている。

【0037】サブケース11の内部には、第1空気通路101を遮るようにして第1板部111が形成され、第1板部111には第1空気通路101の一部をなす第1連通口101aが形成されている。そして、後席フェイスドア30が第1板部111と接離して第1連通口101aを開閉するようになっている。

【0038】なお、112は回転軸13が挿入される軸受溝である。また、113は第2空気通路102を遮るようにして形成された板部で、メインケース1の第2板部1cとともに第2連通口102aを取り囲んでいる。

また、メインケース1の壁面1dには、回転軸13と平

50

(6)

9

行に延び、かつ回転軸13側に向かって突出する突起部1eが形成されており、サブケース11の開口端面114には、突起部1eとの干渉を避けるために切欠き部115が形成されている。

【0039】後席フェイスドア30は、特に図11から明らかなように、比較的剛性の高い材質（ポリプロピレン等の樹脂）からなる基板部301と、多孔質発泡材（例えば発泡ウレタン）からなるシール用のパッキン302とからなる。

【0040】基板部301は、後席フェイスドア30が第1連通口101aを閉じた位置（図11の状態）を基準にして、回転軸13よりも反壁面1d側に延びる主基板部301aと、回転軸13よりも壁面1d側に延びる延長部301bとからなる。また、基板部301は回転軸13の軸芯からオフセットされて回転軸13と一体成形され、基板部301において板部111と接する側の全面が平面になっている。

【0041】そして、基板部301において板部111と接する側の全面にパッキン302が装着（貼付）され、後席フェイスドア30が第1連通口101aを閉じたときには、パッキン302の壁面1d側の端面302aが突起部1eに当接するようになっている。

【0042】上記した本実施形態によれば、後席フェイスドア30のパッキン302を回転軸13よりも壁面1d側まで延長することにより、後席フェイスドア30のパッキン302が板部111に接して第1連通口101aを閉じたときには、パッキン302の壁面1d側の端面302aが突起部1eに当接するようにしているため、メインケース1の壁面1dと回転軸13との隙間からの風漏れを防止することができる。

【0043】また、回転軸13よりも壁面1d側までパッキン302を延長して風漏れを防止する構成であるため、図4、図5に二点鎖線で示す第1部位aおよび図6、図7に二点鎖線で示す第2部位bに板部を形成する必要がなくなり、フットフェイスドア20と第2部位bの板部との干渉の問題がなくなる。

【0044】なお、メインケース1の成形上、フットフェイスドア20の設置範囲まで突起部1eが形成されるが、後席フェイスドア30のパッキン302を回転軸13よりも壁面1d側まで延長して、突起部1eの突出高さを低くしているため、突起部1eとフットフェイスドア20との干渉はない。

【0045】従って、オフセットドアを用いる通路開閉装置において、通路の開閉機能を確保しつつ、メインケース1の壁面1dとオフセットドアの回転軸13との間からの風漏れを防止することができる。

【0046】（第2実施形態）上述の第1実施形態では、パッキン302の壁面1d側の端面302aを突起部1eに当接させることにより、メインケース1の壁面1dと回転軸13との隙間からの風漏れを防止するよう

10

にしたが、図12に示す第2実施形態のように、突起部1eを廃止し、パッキン302の壁面1d側の端面302aを、メインケース1の壁面1dに直接当接させるようにしてもよい。

【0047】本実施形態によれば、第1実施形態と同様に、オフセットドアを用いる通路開閉装置において、通路の開閉機能を確保しつつ、メインケース1の壁面1dとオフセットドアの回転軸13との間からの風漏れを防止することができる。

【0048】（第3実施形態）さらに、図13に示す第3実施形態のように、突起部1eを廃止するとともに、メインケース1の壁面1dに斜め面1fを形成して、後席フェイスドア30が第1連通口101aを閉じたときには、パッキン302の壁面1d側の端面302aの角部を、斜め面1fに当接させるようにしてもよい。

【0049】本実施形態によれば、第1実施形態と同様に、オフセットドアを用いる通路開閉装置において、通路の開閉機能を確保しつつ、メインケース1の壁面1dとオフセットドアの回転軸13との間からの風漏れを防止することができる。

【0050】（第4実施形態）図14は第4実施形態を示すもので、パッキン302の一端を延長したシール部材303により回転軸13の外周面を覆い、シール部材303を回転軸13とメインケース1の壁面1dとの間に位置させている。これにより、シール部材303の外周面がメインケース1の壁面1dに当接して、回転軸13と壁面1dとの間をシールする。

【0051】本実施形態によれば、第1実施形態と同様に、オフセットドアを用いる通路開閉装置において、通路の開閉機能を確保しつつ、メインケース1の壁面1dとオフセットドアの回転軸13との間からの風漏れを防止することができる。

【0052】（他の実施形態）上述の第4実施形態では、シール部材303を回転軸13に装着したが、シール部材をメインケース1の壁面1dに装着してもよい。この場合、シール部材を回転軸13とメインケース1の壁面1dとの間に位置させ、シール部材を回転軸13の外周面に当接させて、回転軸13と壁面1dとの間をシールする。

【0053】また、上述の実施形態では、車両用空調装置を例に本発明の実施形態を説明したが、本発明はこれに限定されることなく、その他の流体通路を切換開閉する装置にも適用することができる。

【図面の簡単な説明】

【図1】本発明者らが開発中の通路開閉装置を含む車両用空調装置における、図3のA-A断面における模式図である。

【図2】図3のB-B断面における模式図である。

【図3】図1および図2の車両用空調装置の正面図である。

(7)

11

【図4】図3のサブケースの斜視図である。

【図5】サブケース付近を図1のC方向から見たC矢視図である。

【図6】図5のD-D断面図である。

【図7】図5のE矢視図である。

【図8】本発明の第1実施形態に係る通路開閉装置を用いた車両用空調装置における、サブケースの斜視図である。

【図9】図8のサブケース付近を図1のC方向から見たC矢視図である。

【図10】図9のI-I断面図である。

【図11】図9のJ矢視図である。

【図12】本発明の第2実施形態に係る通路開閉装置を

12

用いた車両用空調装置図の要部の断面図である。

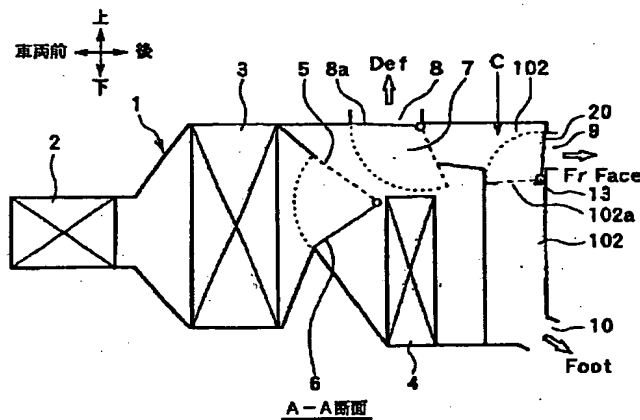
【図13】本発明の第3実施形態に係る通路開閉装置を用いた車両用空調装置図の要部の断面図である。

【図14】本発明の第4実施形態に係る通路開閉装置を用いた車両用空調装置図の要部の断面図である。

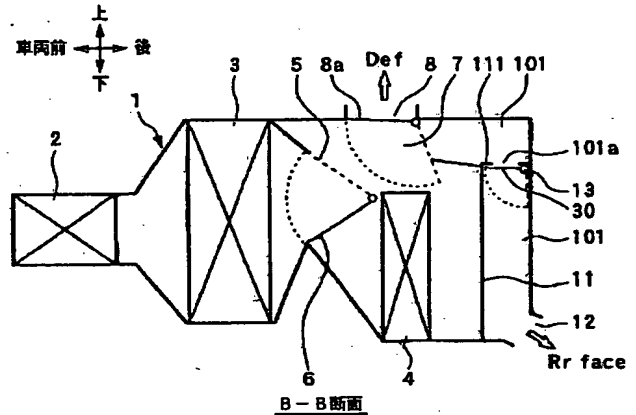
【符号の説明】

1…メインケース、1d…メインケースの壁面、11…サブケース、114…サブケースの端面、13…回転軸、101…第1空気通路、101a…第1連通口、102…第2空気通路、102a…第2連通口、111、113、1c…板部、20…フットフェイスドア、30…後席フェイスドア、302…パッキン。

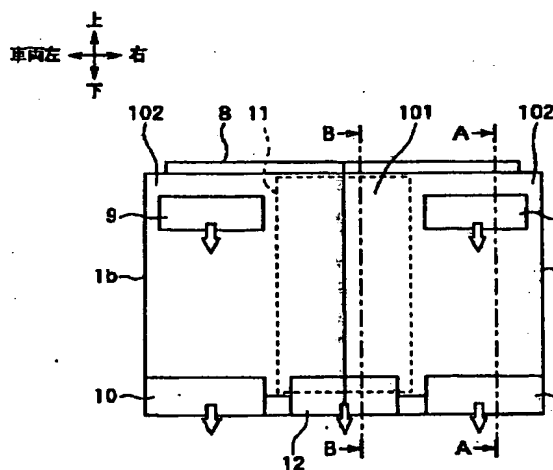
【図1】



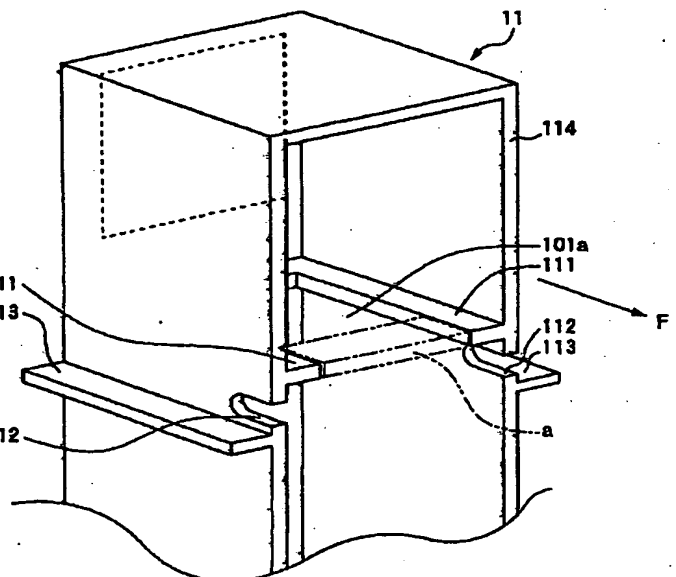
【図2】



【図3】

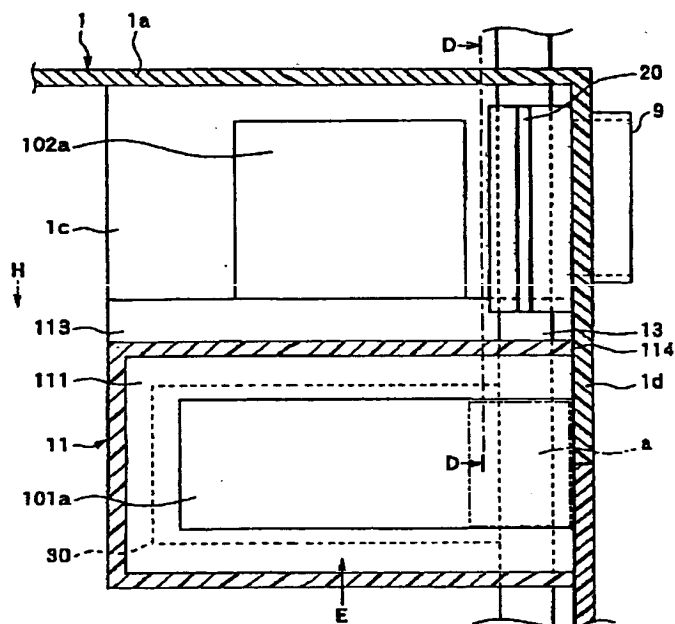


【図4】



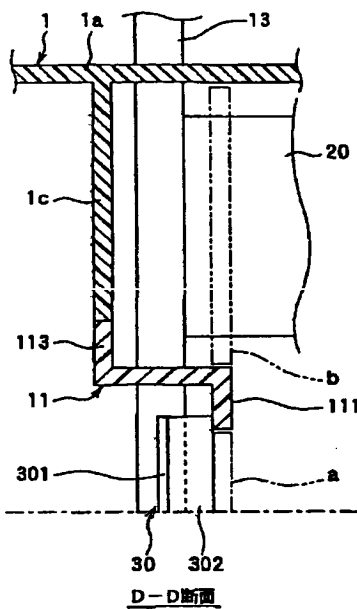
(8)

【図 5】




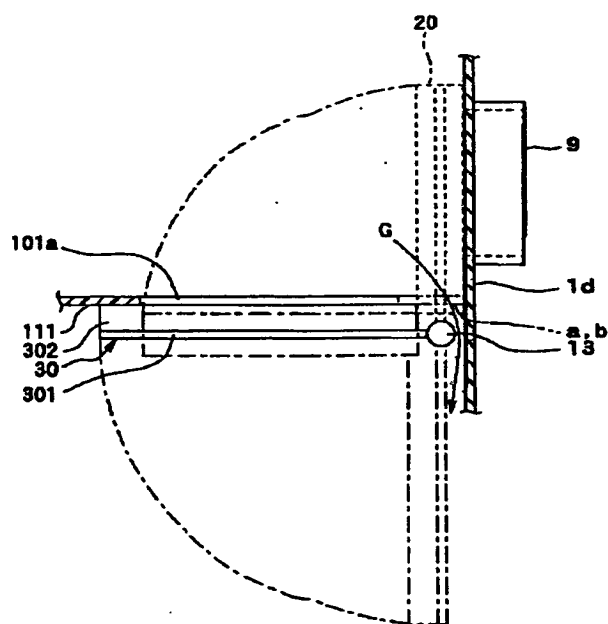
C視

【図 6】



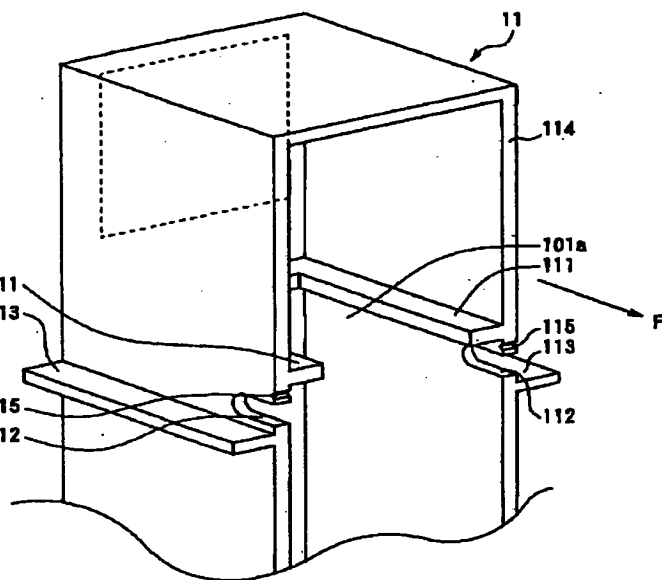
D-D断面

【 7】



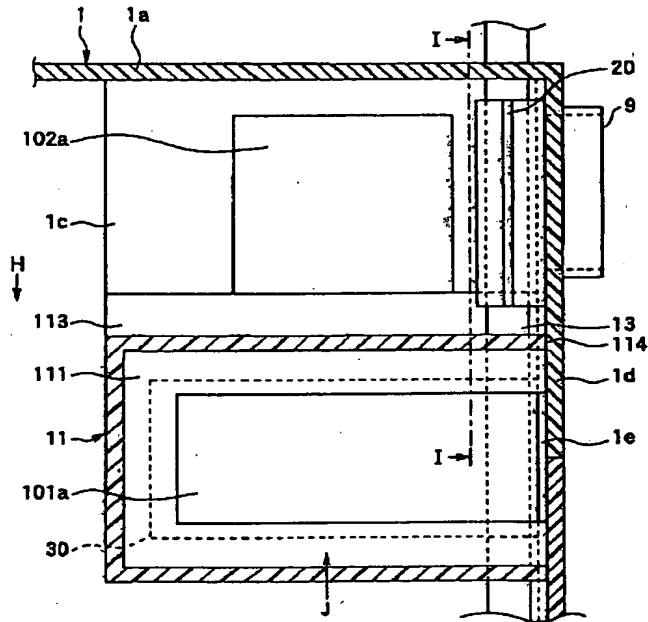
E視

【図 8】



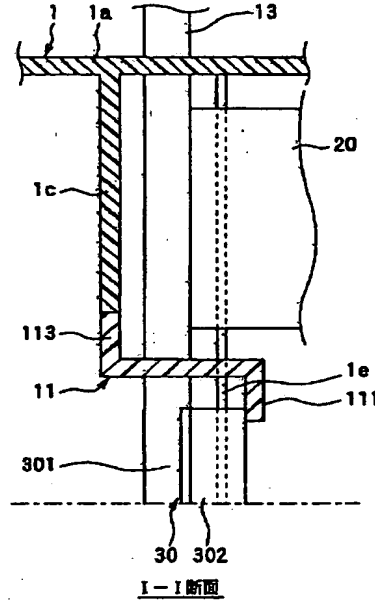
(9)

【図9】



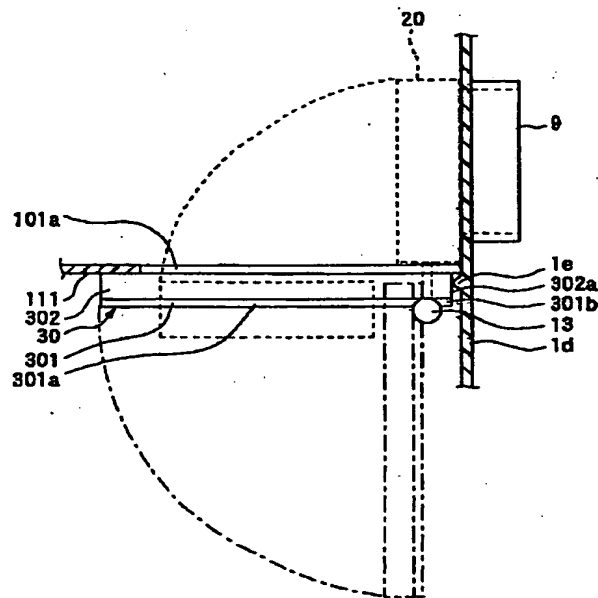
C視

【図10】



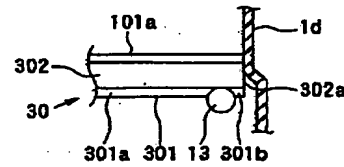
I-I断面

【図11】

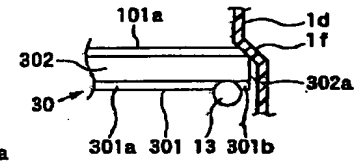


J視

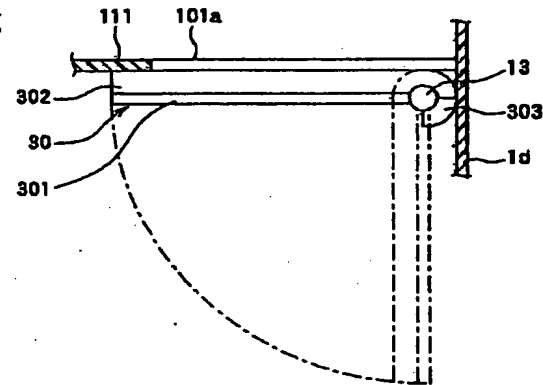
【図12】



【図13】



【図14】



- | | |
|--------------|---------------|
| 1d:メインケースの壁面 | 114:サブケースの壁面 |
| 13:回転軸 | 101a:第1通過口 |
| 111:板部 | 20:フラップフェイスドア |
| 30:後席フェイスドア | 302:パッキン |

(10)

フロントページの続き

(72)発明者 菅田 裕史
愛知県刈谷市昭和町1丁目1番地 株式会
社デンソー内

Fターム(参考) 3L011 BJ02 BL01